An investigation into the influence that social and physical anti-smoking threat appeals have upon adolescent behavioural responses.

Thesis submitted for the

Degree in

Doctor of Philosophy.

By

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Declaration

This work has not been submitted for a degree or diploma in any other University. Parts of this work have been previously published as a conference paper and sections are due to be submitted for journal articles by the author.

Dedication

Dedicated to my parents, family and fiancé,

especially my late grandparents.

Your support and belief

have helped me endure my challenges.

Abstract

The application of social marketing is rising due to its ability to promote behavioural change. This has catalysed the implementation of threat appeals across the health domain. The prominence of including physical threats that aim to elicit a fearful response has prevailed throughout threat appeal research. This over reliance and limited research has provided an opportunity to explore how other content influence attitudes and intentions towards behaviour. To the best of my knowledge, no research has systematically compared the differences between adolescents' responses to social and physical threat appeals, specifically with those aged 11-13 who are the most vulnerable to starting to smoke. With theory suggesting that preventing adolescent smoking initiation holds the greatest reward; a conceptual model has been developed to evaluate how coping response is elicited to threat appeals. The model provides an interesting theoretical approach to evaluate responses that aim to reduce adolescent smoking initiation. Identified as one of the greatest failures in public health, marketing has been recommended to conquer adolescent initiation. The thesis provides innovative results, comparing responses between smoking classifications that provides practical findings. Attitudinal and intentional responses towards smoking was shown to be significantly different between samples depending on threat witnessed, thus identifying the need to segment campaigns. The development of the coping response classification provides a tool to assess whether the observer accepts the threat or disregards it. Specifically the research addresses three areas: 1) To investigate the differences between adolescent non-smokers' and smokers' responses to threat appeals; 2) To compare how social threats and physical threats influence post exposure responses; and 3) To develop a coping response classification to evaluate and estimate attitudinal and intentional responses between samples for each threat appeal to better understand responses to social marketing campaigns.

Acknowledgment

Above all I would like to thank Kent Business School for the opportunity to conduct my novel research that has enabled a career in public health social marketing. The innovative area holds great gains for society and is widely recognised by public health practitioners and health promotion advocates as a method to promote positive behaviour change.

I would like to pay acknowledgement to the participating schools that took part in the research over the past four years. Without their support and enthusiasm the research would have not been possible. I can only hope the interventions and workshops after their participation prevented a number of adolescents from experimenting with tobacco.

Most of all I would like to acknowledge the support and guidance provided by my supervisors, family and friends. Especially Dr Dan Petrovici, without your knowledge and interest in the area, my progression from M(res) to PhD would have not been possible. The support from my family and fiancé has been invaluable, your commitment and endurance to listening to my continuous discussions about anti-smoking threat appeals must have been troublesome. Most of all I can only thank you all for your time and consideration.

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List of Abbreviations

Label	Term
PSA	Public Service Announcement
WHO	World Health Organisation
NHS	National Health Service
PHE	Public Health England
SDPM	The Smoking Decision Process Model
MUSICA	Model of unplanned smoking initiation of adolescents
SEU	Subjective Expected Utility Models
PMT	Protection Motivation Theory
OPM	Ordered Protection Motivation Paradigm
EPPM	Extended Parallel Processing Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
HBM	Health Belief Model
STr	Social Threat
PTr	Physical Threat
NTr	Non-Threat
PV	Parental view
SPP	Susceptibility to peer pressure
SI	Smoking Intent
SA	Smoking Attitude
PT	Perceived Threat
PE	Perceived Efficacy
CV	Critical value
FSA	Future smoking attitude
FSI	Future smoking intent
FSIQ	Future smoking intent
PEm	Physical emotion response
SEm	Social emotion response
PLT	Perceived Level of Threat
AAD	Attitude Towards the Advert
ATAD	Attention Towards the Advert
MD	Message Derogation
EU	European Union
UK	United Kingdom
USA	United States of America
H:*n*	Hypothesis : number

Chapter One

Introduction and overview of the thesis

1.1 Introduction

This chapter outlines the social, health and economic costs that smoking is causing across the globe with a focus on the United Kingdom (UK). The importance of targeting young adolescents to reduce initiation rates with social marketing and influence positive health behaviours is emphasised. This is followed by the rationale, aims and objectives of the thesis. To conclude, the research strands are outlined with the theoretical, methodological and practical contributions proposed.

1.2 The Current Situation

Smoking causes severe problems to society and public health. Not only has the cost of treating smoking related illnesses spiralled as a result of increasing numbers of long term smokers, but smoking is seen to cause various long term chronic diseases (Chen, Chiou and Chen 2008). Smoking has been estimated to result globally in over 5 million deaths each year, of which 120,000 are in the UK, equating to the equivalent of one person dying every 6.5 seconds (Ezzati and Lopez 2003; WHO 2007; Perkins and Scott 2008). This places tobacco as one of the major causes of death and disability across the globe (Murray and Lopez 1997), acknowledging that there is 'no other consumer product that kills as many people as tobacco' (Kees *et al.* 2006; p. 212). As a result of the extensive economic and health related costs incurred from

smoking, there has been a substantial increase in research to establish methods to prevent smoking initiation and catalyse cessation (Keller and Block 1996; Pechmann *et al.* 2003; Samu and Bhatnagar 2008; Dickinson and Holmes 2008). Yet, there is still scope to identify a way to educate potential adolescent smokers' about the risks of smoking in a more targeted, efficient and strategic way.

Smoking prevalence

Although smoking uptake is a lifestyle choice, the consequences of smoking permeates through society. Current estimates report that 25% of adults in the European Union (EU) smoke (WHO 2007), which results in over half a million smoking related deaths each year (Gallopel-Morvan *et al.* 2011). These statistics show that smoking is an issue for all nations within the EU. In the UK, smoking occupies a substantial amount of general practitioner services, results in over 350' 000 hospital admissions and costs the National Health Service (NHS) an estimated £5.2 million each year (Milner and Bates 2002; NHS 2009). Rothschild (1999) highlighted the importance of influencing lifestyle choices to reduce smoking related illnesses which will lower the health care costs, improve the health service and promote improved health and wellbeing. This claim reinforces the need for a better understanding of methods to reduce smoking uptake rates.

Smoking prevalence is a global issue with many areas of the developing world reporting increasing numbers starting to smoke (Jha *et al.* 2002). An estimated 50% of males smoke in developing countries (Yang *et al.* 1999) accounting for over 30% of deaths (Shaw, Mitchell and Dorling 2000). With projections that 85% of the world's smoking population live in developing low to middle income countries (Jha *et al.*

2002) and forecasts that smoking will cause 7 million deaths in developing countries by 2030 (The Global Youth Tobacco Survey Collaborative Group 2002). The importance of developed countries investigating new methods to prevent and reduce smoking initiation has been highlighted. Choe *et al.* (2004) described that current trends of smoking uptake are increasing across the globe to mirror western, developed countries such as the United States (USA). Where an estimated 6000 adolescents experiment with smoking every day (Miller *et al.* 2007) contributing to the projected one million adolescents who start smoking each year (Alexander *et al.* 2001). This only emphasizes the need to find a way to reduce smoking initiation through a low cost medium to inform susceptible segments about the risks of smoking.

One method which is widely used for health promotion is social marketing threat appeals. Whether a health promotion poster, paid social media advert, or cigarette packet warning label, graphic health warnings are synonymous with public health promotions. Anti-smoking threat appeals have been used to prevent smoking rates since the 1970s (Strahan *et al.* 2002; Ruiter and Kok 2005). Recently text warnings were used on cigarette packets in Australia, then Canadian health officials introduced pictorial health warnings on all cigarette packs in 2000. This was preceded by Australian officials enforcing that cigarettes packets remove all branding and being completely covered in graphic pictorial threat appeals. These methods are being used across the globe as best practice, but recent research suggests that smokers' avoid looking at the threating content included on the packets (Maynarda *et al.* 2014) showing the need to investigate coping responses prior to campaign delivery. This shows the difficulties public health professionals encounter when trying to promote behaviour change with a segment that illustrate misplaced optimism. Only with research can the avoidance behaviours that influence optimism be evaluated. This is

achieved through capturing coping responses using behaviour models that estimate observers' responses post observation from a threat appeals stimulus.

Adolescent smoking rates

The major concern with smoking rates is the age of initiation as adolescents' constitute one of the highest percentages of smokers (Grover and Kamins 2008). Recent reports indicate smoking prevalence is climbing among adolescents (Farrelly *et al.* 2002; Chen, Chiou and Chen 2008), with the Centre for Disease Control and Prevention concluding that although smoking prevalence has fallen among most age groups since 1983 in the USA, it is increasing among adolescents aged below 24 years (Murphy-Hoefer, Hyland and Rivard 2010). This shows an increased importance of researching young adolescents.

The danger of adolescent smoking is expressed by various academics that cohesively state the younger one starts to smoke, the more likely he/she is to become a long term smoker, addicted and find it difficult to quit (Pechmann and Ratneshwar 1994; Emery *et al.* 2000; Kim 2006). It was found that if initiation does not occur before the age of 20, smoking uptake is unlikely to start in later life (Devlin *et al.* 2007). Considering Romer and Jamieson (2001) described that '1/3rd of adolescent smokers will die from smoking related causes if they continue to smoke at the same rate as previous generations' (p. 12). On reflection of the statements and the increased vulnerability of adolescent smoking to cause addiction escalates the importance of reducing adolescent smoking initiation and prevalence. This demonstrates the need to develop and implement methods to reduce smoking initiation among young adolescents' prior to experimentation and becoming accustomed to smoking. It is particularly important

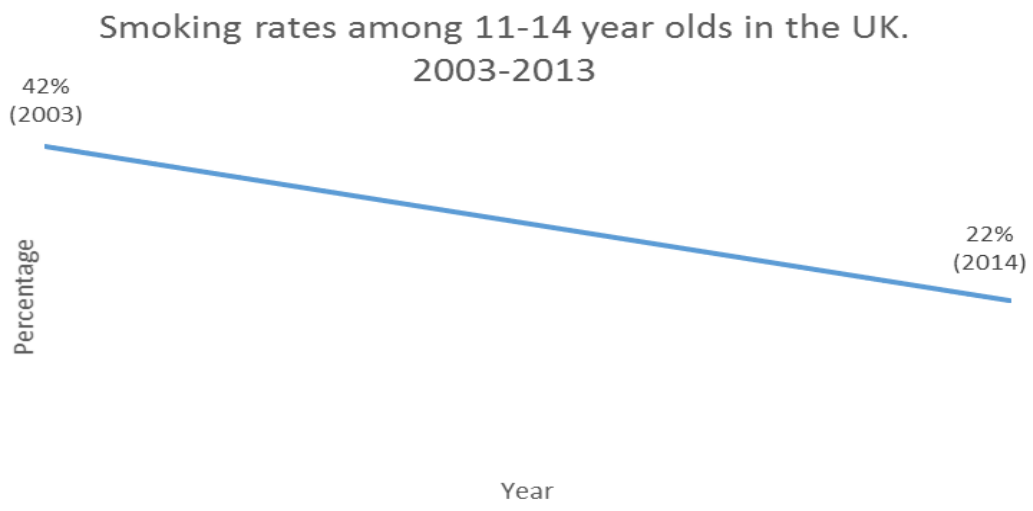
in school settings as the highest proportion of smokers have been reported to be when leaving compulsory education (Samu and Bhatnagar 2008). High rates of adolescent smoking initiation has been reported which is expressed in Table 1.1 which shows rates from across the world.

Table 1.1 Smoking initiation ages across developed countries

Smoking Initiation Findings	Study
In the UK, 6% of 11-14 year olds regularly smoke each week.	NHS (2009)
In the UK, 22% of 11-15 years olds try smoking each week.	Health and Social Care Information Centre (2014)
In the UK, 90% of smokers have experimented before the age of 18.	NHS (2009)
In the USA, 90% of smokers have experimented before the age of 21.	American Lung Association (2008)
In Canada 85%, of smokers have started before the age 19.	Sabbane, Lowrey and Chebat (2009)
Various research projects have concluded 85%-90% of daily smokers have experimented with cigarettes by the age 18.	Lynch and Bonnie (1994); Thomas *et al.* (1998); Pechmann *et al.* (2005)
In Europe, 40% of adolescents' aged less than 13 years has experimented at least once with smoking.	WHO (2003)
In developed western countries it is reported that 22% of 12-15 years olds being regular experimenters in tobacco.	Warren *et al.* (2006)
1 in 6 adolescents' aged 12 have already tried smoking in the USA.	McVie and Bradshaw (2005)
56% of daily smokers sampled had experimented before the age of 13	Lynch and Bonnie (1994)

Of greatest importance is the statistics expressed in the Health and Social Care Information Centre report that stated 22% of adolescents aged 11-14 are regularly experimenting with tobacco. This supported by other reports that show more than a fifth of all 11-14 year old adolescents in the UK are engaging in illegal tobacco usage each week (NHS 2014). Although this is a reducing rate compared to previous years when 42% of adolescents were smoking each week, Figure 1.1 illustrates that currently, at least 1 in 5 adolescents' are experimenting with tobacco from 11 years old. Although the rates are reducing, these statistics do not take into account the large amount of electronic cigarettes which is increasing among adolescents (Ramo, Young-Wolff and Prochaska 2015).

Figure1.1 11-14 year old smoking rates in the UK
(Health and Social Care Information Centre 2014)



Research concludes that the initial experimenters in early adolescence, often aged younger than 13 years frequently progress into becoming long term smokers (Pechmann *et al.* 2005). It is widely regarded through-out the literature and government reports that most smoking is initiated during adolescence (Ho 1998) with males having a slightly greater smoking prevalence at 22% than females at 19% (Health and Social Care Information Centre 2014). Research is needed to understand

how to effectively communicate with potential adolescent smokers, and importantly uncover the mechanisms that influence adolescent smoking prevention and smoking cessation. Rather than persuading existing established smokers, this research focuses on young adolescents and aims to help achieve the claim that 'a significant increase in committed never smokers among 10-14 year old could signify a future decrease in the number of young people who become established smokers' (Choi *et al.* 2001; p.320).

1.3 Social Marketing and need for behaviour change

Research is needed to find a method to communicate the risks of smoking that is easily implemented with adolescents throughout various marketing channels. Marketing methods hold great potential to reduce smoking initiation rates through social marketing methods using effective anti-smoking threat appeals. The ability of marketing techniques to tackle social issues has been highlighted by various academics including Petty and Cacioppo (1996), who stated there is a need to design social marketing that will prevent adolescents' from starting to smoke. Further support for threat appeals has been made, stating that the medium can educate adolescents' about the health information concerning smoking (Pechmann and Ratneshwar 1994). This shows the importance of developing threat appeals specifically for adolescents that can be used offline and online through social media paid advertising, digital channels and traditional print communications.

Marketing is used in all sectors to communicate with the public (Rothschild 1979). The objective is always to build a positive relationship with the observer and influence a desired behaviour (Evans 2008). Marketing ultimately tries to influence certain behaviours concerning actions after exposure to a marketing communication

message (Peter, Olson and Grunert 1999). The dynamic interaction of affect, cognition, behaviour, and intentions are of particular interest to marketing research (Bennett 1989). Although limitations suggest that marketing only represents a brief snap-shot into reactions (Machleit and Eroglu 2000), this highlights the importance of investigating responses to marketing communications to ensure the desired behaviour change message is acknowledged in the first instance. Behaviour change is a long term strategy and a single marketing communication will not cause a behaviour change, but has the opportunity to empower one to think differently and challenge pre-existing lifestyle choice beliefs.

Marketing methods are able to promote more than just goods and services (Wiebe 1951). They have been shown to reduce demand through de-marketing (Kotler and Levy 1969), which uses counter marketing communications widely used to reduce unhealthy behaviours (Goldberg and Gunasti 2007). Research has frequently suggested the opportunities that marketing holds for positive behavioural change, although the difficulties are acknowledged being different to selling products, the concept has been recognised in marketing research for over 40 years (Rothschild 1979; Bloom and Novelli 1981). The alternative approach for marketing was identified in 1971, representing a method to influence societal change through marketing communications (Kotler and Zaltman 1971). Formed on the premise that marketing concerns all transactions, hence, it must adopt a broader approach to deal with a range of social issues (Kotler and Levy 1969). Subsequently marketing has evolved to deal with human welfare, pursuing the needs of society as well as economic gains and behavioural change (Shuptrine and Qsmanski 1975; Andreasen 2003).

Although social marketing has recently been pushed to the forefront of marketing research, findings have not flourished, leaving it in its infancy and in need of further attention (Andreasen 1993; Madill and Abele 2007; Merritt *et al.* 2009; Truong 2014). The prime example of the developing paradigm (Smith 2000) is expressed by the 45 definitions in 40 years (Dann 2010). Numerous definitions circulate around the application of marketing knowledge, concepts, and techniques to overcome social issues and improve physical and mental wellbeing, and ultimately the society they inhabit (Lazer and Kelly 1973; Andreasen 1993).

Social marketing uses marketing exchanges that encourage the adoption of practices or promote behavioural change that benefit public health and society as a whole (Forthofer 2003; Pirani and Reizes 2005; Tan *et al.* 2010). This approach to behaviour change is perceived to draw and adapt the most effective capabilities of the commercial marketing conceptual framework (Hastings and Saren 2003; Grier and Bryant 2005; Dann 2010). It utilises market research, situational analysis, exchange theory, audience segmentation and the marketing mix (Andreasen 1993; Tan *et al.* 2010; Grier and Bryant 2005; Beerli-Palacio and Martín-Santana 2015) in order to achieve behavioural change (Andreasen 2002). It was argued that 'success in the social marketing arena requires greater ingenuity and imagination than commercial marketing' (Bloom and Novelli 1981; p. 87), showing the importance of market research to inform public health professionals social marketing behaviour change campaigns, strategies and plans.

Social marketing in the context of public health

The role of using marketing methods is paramount to achieving a health promotion campaign. Although public health promotions are frequently regarded to use a standard mass communication approach (Leventhal and Cleary 1980), this is incorrect. Social marketing focusses on objectives geared towards influencing behaviour change (Hastings and Saren 2003), ultimately providing the health sector with marketing tools to communicate with targeted high value messages about health and how to make positive behavioural changes (Alves 2010).

Although there are difficulties when communicating sensitive health education issues through marketing channels (Hastings and Haywood 1991), this is an issue for all marketing methods. Social marketing provides a communication method that can prevent the onset of problematic behaviours (Frankenberger and Sukhdial 1994), influence desirable social change (Goldberg 1995; McDermott, Stead and Hastings 2005), tackle social problems (Andreasen 2003; Rossiter and Jones 2004), and synergistically combine social problems and ill health promoting voluntary behavioural change (Smith 2002; Hastings and Saren 2003). Social marketing differs from traditional health education campaigns (Pirani and Reizes 2005) and is of relevance to health promotion practitioners (Late 2004) being able 'to bridge the gap between health education and regulation' (Pirani and Reizes 2005; p. 132) using tailored interventions. Although nearly 900 articles have been published on social marketing since 1998, public health has been the prominent topic under investigation (Truong 2014). The presence of behaviour change theories or quantitative research are not well reported highlighting an opportunity to provide robust and theoretical contributions that can be confidently implemented by policy and practitioners.

The capabilities of social marketing have been identified in the public sector by public health practitioners (Griffin and O'Cass 2004; Grier and Bryant 2005; Madill and Abele 2007). Since government officials believe public health marketing can promote behavioural prevention (Salovey *et al.* 2000; Manyiwa and Brennan 2012), social marketing has been highlighted as a key tool in a U.K public health white paper (Department of Health 2004) forming a central aspect of the Public Health England (PHE) marketing strategy (PHE 2014). Although the grasp of social marketing by health officials is often misunderstood (McDermott 2000), policy makers encourage advertising agencies to present health information through various marketing mediums (Beltramini 1988), especially 'persuasive health messages which are a central component of efforts to promote healthy behaviour' (Riet *et al.* 2008; p. 800).

The rising acceptance of social marketing is expressed by health educators who acknowledge marketing methods over other disciplines including psychology to create brief pervasive public service announcement advertisements, which aim to inform, educate and influence the public (O'Keefe and Reid 1990; Hastings and Haywood 1991; Dillard and Peck 2001). Public service announcements constitute a large part of social marketing (Bagozzi and Moore 1994), which model desired behaviours through positive reinforcement to influence consumer behaviour traits (Peter, Olson and Grunert 1999). Research with the Advertising Research Foundation concluded that public service announcements are effective mediums to influence the public to make major changes to health behaviours, such as the campaigns aimed to influence national well-being such as 'change 4 life', 'Stoptober' or 'tobacco truth' campaigns (Evans *et al.* 2004; PHE 2014). The empirical implications of 'upstream' social marketing research has shown to influence regulation on issues including

smoking, drug use, diets and alcohol (Farrelly *et al.* 2002; Hastings 2003; Gordon *et al.* 2010; Beerli-Palacio and Martín-Santana 2015).

Need for more social marketing research

Considering that 'marketing strategies are designed to ultimately influence consumer behaviour' (Peter, Olson and Grunert 1999; p. 236). A deeper understanding is needed for social marketing to progress and to target public health concerns and public policy issues (Raghubir and Menon 1998; Merritt, Christopoulos and Thorpe 2009). Although social marketing research has been conducted in numerous areas including family planning, recruiting blood donors, infant rehydration, obesity, healthy eating, sun protection, smoking, drug use, binge-drinking, tobacco smoking, as well as other preventative health behaviours (Farrelly *et al.* 2002; Smith and Stutts 2003; Grier and Bryant 2005; Rayner 2007; Sharma and Kanekar 2007; Cox 2008; Kolodinsky and Reynolds 2009; Luca and Suggs 2010; Kemp and Verne 2011; Beerli-Palacio and Martín-Santana 2015). Goldberg (1995) urged are 'researchers fiddling while Rome burns? There are clearly many fires that social marketing can fight' (p 367) suggesting that the scope of social marketing is underestimated. Truong *et al.* (2014) stated that social marketing is rising as a subject for doctoral dissertations, since social marketing inception in 1971 there has been 93 completed dissertations with 80% completed in the UK or USA. The research provides limited attention on theoretical development, with an emphasis on the established health models and behaviour change principles proving little innovation. Considering many of the concepts and theories used within social marketing are common to behaviour change theories (Rayner 2007), any scientific findings on the effectiveness of social marketing

influencing behaviours is of high interest and importance to public health practitioners, policy makers, consumer researchers and marketing professionals (Tangari *et al.* 2007; Helmig and Thaler 2010). Especially as health professionals need to be able to influence health-enhancing behaviours (Dickinson-Delaporte and Holmes 2011). Addressing social problems from a social marketing perspective provides a deeper insight into people's perceptions, opinions and views of the social issues under investigation (Griffin and O'Cass 2004), raising the importance of social marketing research understanding how to communicate specific behavioural change.

The role of behaviour change is core to the social marketing concept as it 'is really all about influencing behaviour' (Andreasen 1993; p. 111), with the central outcome being either a temporary or permanent behavioural change (Dann 2010). The influence that marketing has upon behaviour change has been utilised in areas of public health through various marketing methods with promotion and advertising remain the most frequent methods. Considering the public endure a continuous bombardment of marketing pressure, little attention consciously given to marketing as the consumer space is saturated (Ha 1996). As the world of advertisements is compiled with a multitude of imagery ranging from sensual to threatening situations (Scott 1994), the importance of implementing innovative marketing strategies that gain the public's attention is paramount to promoting behaviour change. Especially as it is widely recognised that increased arousal to a counter-marketing communication is prerequisite for behavioural change (Leventhal, Singer and Jones 1965; Rippetoe and Rogers 1987; Quinn, Meenaghan and Brannick 1992; Bagozzi and Moore 1994; Bennett 1996; LaTour and Rotfeld 1997; Arthur and Quester 2004; Smith and Stutts 2006; Dickinson and Holmes 2008).

The way the increased arousal is perceived to influence behaviour provides opportunities to develop the existing threat appeal models. The role of attitude and intention influencing behaviour is the pathway metric used in short term marketing research, longitudinal studies are able to monitor actual behaviour change. The concept of coping response provides a construct to evaluate response to advertising and assess which campaign is the most influential. The coping response classification has provided initial evidence to behavioural change advertising. One method that is common practice is to incorporate threat appeals into the development of a social marketing campaign to promote the emotion of fear (Higbee 1969; King and Reid 1989; Hyman and Tansey 1990; Tanner, Hunt and Eppright 1991; Bennett 1996; Snipes, LaTour and Bliss 1999). Many marketing practitioners believe that promoting a fearful response is essential for motivating and encouraging positive behavioural change (Henthorne, LaTour and Nataraajan 1993; Rossiter and Thornton 2004; Smith and Stutts 2006; Thompson, Barnett and Pearce 2009). This is the prevalent method used in traditional anti-smoking advertising to influence attitudes and intentions (Donovan and Henley 1997) used in cigarette warning labels with no concrete evidence that they reduce smoking rates (Maynarda *et al.* 2014).

1.4 Rationale for the research

A review of the current literature identifies various inconsistencies with research into social marketing anti-smoking threat appeals. The prevalence of focussing on a fearful emotional response has limited research into other emotions, with the focus on physically threatening content diminishing the opportunity to research how other emotions are elicited from socially threatening situations (Henley and Donovan 1999). Young adolescents' are most vulnerable to smoking initiation and disregard

long term views on smoking depicted in physically threatening advertisements. Research comparing adolescents' responses to socially and physically threatening anti-smoking advertisements will provide insight into the prevalent emotions that influence behavioural measures among young adolescents. Especially as the smoking prevalence of adolescent school pupils' has been regarded an understudied demographic (Alexander *et al.* 2001; Goodall and Appiah 2008).

To the best of the author's knowledge, no research to date has compared adolescent non-smokers' and smokers' responses to social and physical threat appeals. Particular attention is given to the role that physical emotions, including fear, has within threat appeal models and the negligence of how social emotions could be influential among adolescents at influencing prospective smoking behaviour. Social influence is incorporated into the research to provide a holistic view towards adolescents' smoking beliefs taking into consideration influential facets. The development of new scales and an evolved conceptual model provides an array of innovative findings to enrich social marketing and public health behaviour change efforts for young adolescents. The role of the coping response is captured to provide insight into how adolescents respond to the different threat appeals, with message processing included to monitor how advertisement involvement influences self-reported behaviours.

1.5 Research aims and research propositions

This research aims to investigate how social and physical threats influence 11-13 year old adolescent non-smokers' and smokers' self-reported behavioural responses. The role of social and physical emotional responses and message processing facets investigate the relationship between each threat and post exposure behavioural

measures. It is believed that the research will provide innovative knowledge about how the cluster of physical emotions and social emotions influence future smoking attitude, future smoking intentions and future smoking intentions to quit from exposure to either a social threat or a physical threat. This will provide insight into alternative threat appeal content that can be used to target adolescents. The research moves a step forward from current threat appeal research that just review participant's views of threat appeals and does not examine how physical and social emotional responses influence future self-reported behaviour. A new conceptual model is explored proposing a combination from previous threat models and health behaviour models, integrating influential facets, coping responses and a dichotomy of emotions clusters estimating behavioural responses. The study aims to enrich the literature and provides practical suggestions for health practitioners and marketers to be able to communicate more effectively with the highly vulnerable young adolescent non-smokers, and understand how to communicate with young adolescents' who have experimented with smoking. This research aims to address a number of research strands that are highlighted by the six propositions described in Table 1.2 which describes the developed conceptual model to estimate adolescents' smoking intent and attitude responses to understand:

a. The differences between non-smokers and smokers,
b. The differences between social and physical threats, and
c. The differences between critical value emotional and danger control groups.

Table 1.2 Overview of Research Propositions

Proposition Number and Description	Research overview
Proposition #1: 'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'	The differences between non-smokers' and smokers' responses to both types of threat appeals are explored to identify the heterogeneity of the adolescent sample.
Proposition #2: 'Post exposure behavioural responses will be significantly different between threats'	The response differences between physical threats and social threats are explored.
Proposition #3: 'The perceived level of threat will significantly influence post exposure responses to each threat condition'	The influence of the perceived level of threat is explored for adolescents' behavioural responses to threat appeals.
Proposition #4: 'The critical value will significantly influence post exposure behavioural responses to each threat condition'	The influence that the critical value has upon influencing behavioural responses is explored for adolescents.
Proposition #5: 'Social factors will significantly influence smoking beliefs and attitudes'	The influence that two social factors have upon smoking behaviour is explored
Proposition #6: 'The type of emotional response will influence post exposure response'	The two clusters of emotional responses are in relation to post exposure responses.

The research propositions outline a series of exploratory research hypothesis based on previous research which will provide a greater understanding of how adolescents' respond to threat appeals based on their smoking experience, social influence and their cognitive message processing. There are numerous hypotheses due to the nature

of the research explained in detail in the Appendix A.1 and described with results in Chapter 5.

The propositions are highlighted throughout the literature review during the relevant sections providing support and emphasizing the importance of investigating each proposition with adolescents. The research holds a number of major strands as shown in Table1.3 but also provides methodological contributions. The strands outline the structure of the thesis showing how each strand achieves a specific objective.

Table 1.3 Research structure of the research

Research strand	Objective	Section
Segmentation	Review need to segment 11-13 year old adolescents.	2.3
Threat content	Previous content and perceived level of threat.	2.4
Model Development	Review previous behaviour model and theories.	3.2
Conceptual model	Provide conceptual model and factors.	3.3
Scale development	Illustrate the different facets and scales developed.	4.4
Preliminary research	Confirm the scales, stimuli and research approach.	4.6
Holistic results	Results: Differences between adolescent samples.	5.2
Non-smoker results	Results: Non-smokers results between threats.	5.3
Smoker results	Results: Smokers results between threats.	5.4

Research Contributions

This research represents the first study to assess the role of social and physical threats upon negative emotional clusters (social emotions and physical emotions); message processing and how social influential facets influence young adolescents' perceptions

of anti-smoking threat appeals within a conceptual model tested in a sample of non-smokers and smokers. This study explores social influence, attitudes, intentions, and coping responses among a highly vulnerable segment where the depth of addictive behaviour is not well established. The findings are expected to contribute to the field both theoretically and practically. The findings are important to marketing researchers, health practitioners, policy makers and vulnerable adolescents. Specifically this research makes the following contributions to threat appeals and health interventions with practical implications.

From a theoretical and methodological view point, this research:

- Proposes a conceptual model to estimate adolescents' self-reported behavioural responses to threat appeals.
- Provides insights into adolescents' responses to different types of threatening stimuli regarding health promotion.
- Obtains exciting results that advance the knowledge of the role of previously overlooked emotions on behavioural measures.
- Uncovers the influential facets contributing to adolescent smoking behaviour.
- Presents a selection of new scales developed to understand adolescents' coping response and message processing towards threat appeals.

This research has also interesting practical implications as the results will

- Improve health marketing practitioners understanding of how social and physical threats influence adolescent non-smokers' and smokers' future smoking intentions and future smoking attitudes.
- Inform health marketers about the importance of focusing on specific emotions to be elicited from certain threats to improve coping response.
- Provide information about the importance of tailoring health messages to non-smoking adolescents and smoking adolescents.

1.6 Summary

This chapter outlines the aims and objectives of the thesis. The current situation and importance of reducing smoking prevalence and initiation rates among adolescents in the UK is made. The opportunity to utilise social marketing is discussed with an emphasis on the innovative research into threat appeals and behaviour change with a focus on public health. The methodological, theoretical and practical research contributions are highlighted. The next chapter discusses the importance of targeting adolescents and reviews the literature on threat appeal research.

Chapter Two

Literature Review:

Adolescent vulnerability and the development of threat appeals

2.1 Introduction

This chapter outlines the importance of targeting adolescents with tailored social marketing behaviour change campaigns to influence problematic behaviours, with an emphasis on anti-smoking. Initially, the importance of targeting adolescents' that express reduced risk having a higher vulnerability to engage in dangerous behaviours is provided. The need to reduce smoking initiation is described with current smoking rates, reports and studies. This leads to a discussion of threat appeal research and the implications of social marketing outlining the opportunities and acknowledging the limitations. To conclude, the emphasis of emotional responses within threat appeals and the need to explore the content and perceived level of threat of anti-smoking threat appeals is provided outlining the initial three propositions.

2.2 Adolescent problematic behaviours

There is a need to investigate how responses to health advertisements influence adolescents' that engage in risky activities more than any other age segment (Steinberg and Cauffman 1996; Spear 2000; Cauffman and Steinberg 2000; Wulfert *et al.* 2002). Especially targeting those under 15 who experiment with smoking (McVie

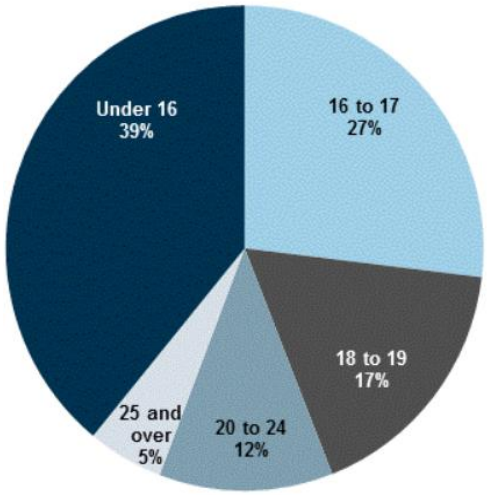
and Bradshaw 2005) as reports concluded that upwards of 80% of adolescents' aged between 11-15 engage in behaviours including smoking (Maggs, Almeida and Galambos 1995) emphasizing that 'central to the issue, is how to design social marketing that will prevent youngsters from starting smoking' (Pechmann and Ratneshwar 1994; p. 236).

Incidence of Smoking Rates

Reducing adolescent smoking initiation is a global issue (Miller *et al.* 2007) as cigarette smoking holds the lowest decline in adulthood from common addictions (Chen and Kandel 1995; Bachman *et al.* 1997) and the average age for smoking initiation is declining (Pechmann and Ratneshwar 1994). Although 'most cigarette smokers take up the habit during adolescence' (McNeill *et al.* 1989; p.72) with the mean age of initiation fluctuating between 13-15 years old (Elders *et al.* 1994; Choi *et al.* 2001; Orlando *et al.* 2004) and initiation occurring as early as 10 years old (Choi *et al.* 2001). Smoking initiation is frequently classified as an adolescent behaviour (Lee, Gilpin and Pierce 1993) with young adolescents' aged 11-15 most susceptible to smoking experimentation and initiation (Flay, Ockene and Tager 1992; Winkleby, Fortmann and Rockhill 1993; Lynch and Bonnie 1994; Ho 1998; Johnston, O'Malley and Bachman 1999; Gilpin *et al.* 1999; Chassin *et al.* 2000; Myers and Frost 2002; Pechmann *et al.* 2005). This is further illustrated in Figure 2.1 that shows the percentage of adolescents' starting to smoke before 16 years old in the UK.

Figure 2.1 Age at which people in UK started smoking regularly, 2010

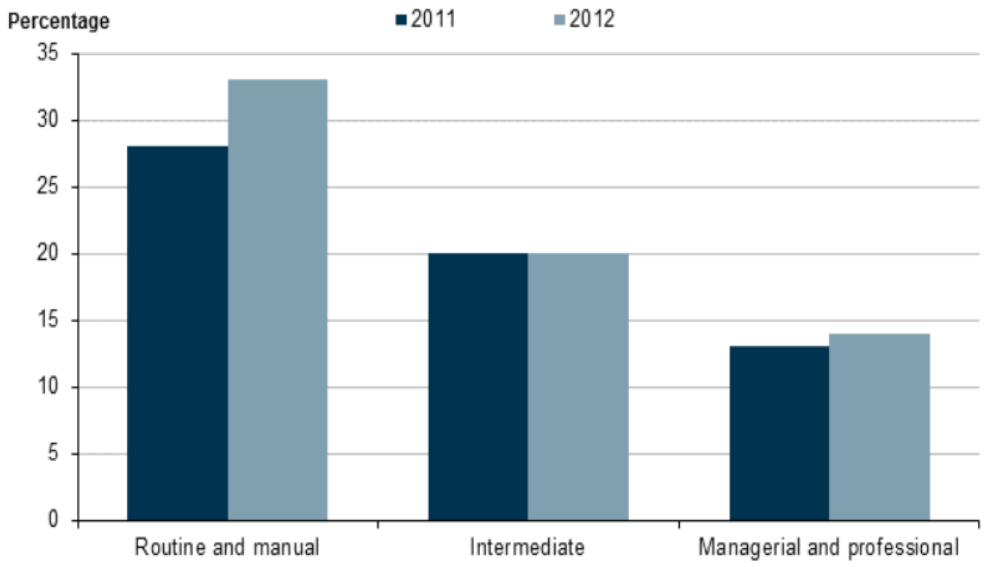
(Office for National Statistics 2013)



An adolescents' social environment is extremely influential, as certain socio-economic backgrounds have a greater smoking influence that is expressed in Figure 2.2. Recent reports show that adults with routine and manual occupations are more likely to have started smoking before 16 years than those in managerial (45%) and professional (31%) households (Health and Social Care Information Centre 2014).

Figure2.2 Rates of cigarette usage in UK based on socio-economic classification

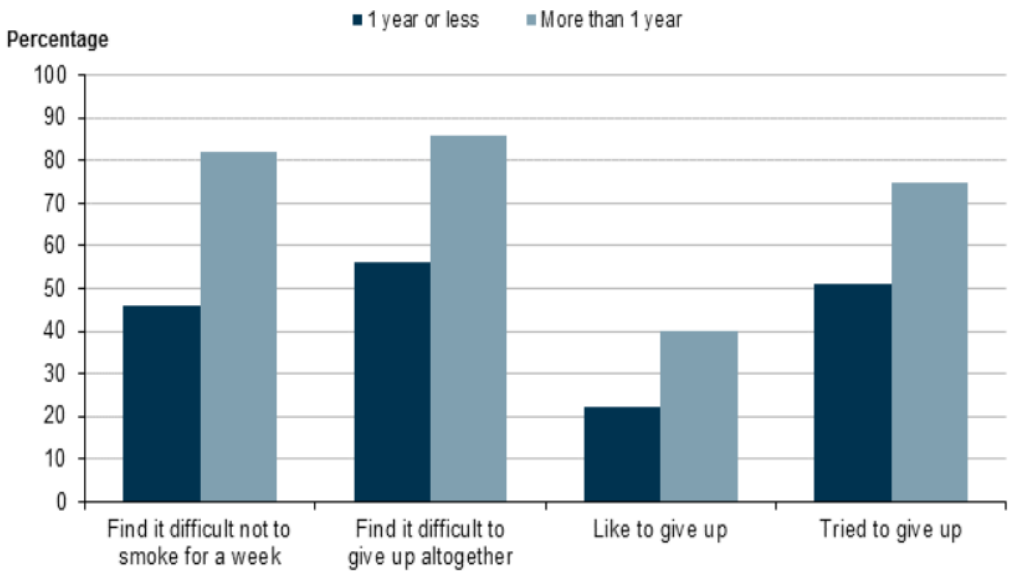
(Office for National Statistics 2012)



Early experimentation during adolescence escalates the risk of becoming a regular smoker during young adulthood (Krohn *et al.* 1983; Glynn 1993; Escobedo and Marcus1993; Elders *et al.* 1994; Chen and Kandel 1995; Pierce and Gilpin 1996; Bachman *et al.* 1997; Bachman *et al.* 1997; Chassin and Presson 1998) with an estimated 80-90% who start smoking in adolescence continue (Lynch and Bonnie 1994; Kessler *et al.* 1996; Tangari *et al.* 2007; NHS 2009). Devlin *et al.* (2007) highlighted the necessity of targeting adolescents' before experimenting or establishing a smoking habit, especially as 'Adolescent smoking is not a passing fad or a brief phase of life, but an addictive behaviour that continues throughout adult life' (Elders *et al.* 1994, p. 544). Evidence suggests reduced levels of smoking initiation occurs after turning 21 years old(Chen and Kandel 1995), with post adolescent new smokers being more likely to quit than if started in adolescence (Chassin *et al.* 1996). This supports the claim that 'if adolescents can be kept tobacco free, most will never start using tobacco' (Elders *et al.* 1994; p.543). There are numerous factors to consider as age at initiation and smoking duration influence smoking initiation with adolescents' being more likely to quit if they had smoked for less than a year. As newly acquired habits are easier to break emphasising the need to prevent early onset as shown in Figure 2.3 but research must acknowledge that smoking is influenced by a myriad of factors not entirely captured by research.

Figure 2.3 Perceived smoking dependency in UK by time as a regular smoker

(Health and Social Care Information Centre 2013)



Health practitioners face various challenges when trying to identify those most likely to take up smoking (McNeill *et al.* 1989), with the smoking prevalence of the adolescent school segment being an understudied demographic (Alexander *et al.* 2001; Goodall and Appiah 2008). It is believed that smoking prevalence escalates when adolescents' progress from primary school into secondary school (Winkleby, Fortmann and Rockhill 1993) emphasizing the necessity of researching adolescents' entering secondary school to assess how school based settings influence smoking initiation (Murphy-Hoefer, Hyland and Rivard 2010). The importance of influencing adolescents before smoking initiation is made by numerous academics, as each cigarette increases the chance of frequent smoking (Chassin *et al.* 1990; Otten *et al.* 2007) with weekly smoking being a significant contributor (Kelder *et al.* 1994). Although those irregularly experimenting are at risk (Chen and Kandel 1995), smoking a small number of cigarettes can lead to regular smoking (Russell 1971; Leventhal and Cleary 1980; Hirschman, Leventhal and Glynn 1984; McNeill 1991). The time between initial experimentation and continued usage is a critical period;

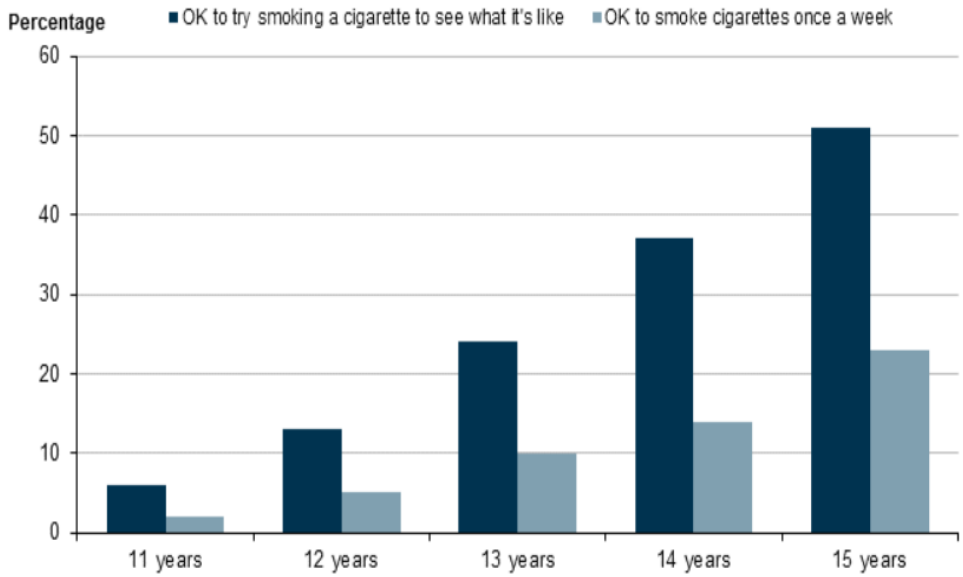
estimated to last between 1-3 years (Hirschman, Leventhal and Glynn 1984; Leventhal, Glynn and Fleming 1987; McNeill 1991; Henningfield, Cohen and Slade1991; Pierce *et al.* 1996) suggesting health practitioners have little over a year from initial experimentation to reduce intentions to continue smoking. This identifies the most vulnerable and influential adolescent age segment are those between 11-13 years old before experimenting and habit formation is established as entering secondary school.

Adolescent reduced perception of risk

Adolescents' underestimate the risk and danger of smoking with a false sense of immortality (Leventhal, Glynn and Fleming 1987) forming an adolescents' personal fable (Elkind 1967). The constant underestimation of risks associated with smoking (Hammond *et al.* 2004; Romer and Jamieson 2001) presents concern. Although adolescents' are aware of the dangers from a young age (Bendelow, Williams and Oakley 1996), often ignoring the harmful effects of smoking with a belief of invulnerability (Fox *et al.* 1998; Kessler *et al.* 1996; Fischer *et al.* 1993). A common explanation for this is a concrete, egocentric thinking perspective not being future oriented (Brooks-Gunn, Boyer and Hein 1988) and perceiving that anti-smoking threat appeals have no self-relevance (Lennon and Rentfro 2010). An example of this is the belief of being able to smoke cigarettes for a few years and successfully quit before suffering any health consequences or possible addictions that would affect adults (Arnett 2000). Figure 2.4 expresses that even at 11, adolescents' perceive it is acceptable to experiment with cigarette smoking 'to see what it is like'.

Figure 2.4 Attitudes to smoking among adolescents' in England by age 2012

(Health and Social Care Information Centre 2013)



Theorists have provided several explanations for the underlying mechanisms of biased perception of risk (Perloff and Fetzer 1986), circulating around the concept that people underestimate the chance of contracting a disease or foregoing behaviour. The prevalent descriptions are self-positivity bias (Raghubir and Menon 1998) and unrealistic optimism (Weinstein 1980):

Self-positivity bias presents the largest challenge for health marketers as overcoming self-positivity bias is paramount to increase acknowledgement of health prevention information (Menon, Block and Ramanathan 2002). Self-positivity influences perceptions of invulnerability and expressing a lack of attention to acknowledge the advertisement, thus has little emphasis on changing attitudes, intentions or behaviours (Raghubir and Menon 1998). This 'is of critical concern for social marketers as it implies that people have the tendency to assume that they are special and impervious to the social marketing issues being advertised' (Raghubir and Menon 1998; p. 53). Such as perceptions of being less likely to contract viruses such as AIDS virus from unprotected sex, lung cancer from smoking or obesity from a poor diet.

Unrealistic optimism, also termed optimistic bias is the prevalent perception of risk construct with over 100 published studies over the past 30 years that concern health risk perception (Chaplin *et al.* 2001). It refers to the underestimation of experiencing a negative event (Weinstein 1980; Taylor and Brown 1988) which has the potential to influence behaviour (Weinstein 1989). Optimistic bias is shown to increase with greater levels of perceived behavioural control (Waltenbaugh and Zagummy 2004) that influences coping response and has investigated health risk perception towards various topics described in Table 2.1.

Table 2.1 Studies that include the perception of risk towards health

Studies	**Health Behaviour Risk**
Strecher, Kreuter and Kobrin (1995); Borrelli *et al.* (2010)	Smoking risks
Eldridge and Lawrence (1995); Witte (1997)	Contraception and pregnancy
Glanz and Yang (1996)	General health risks
Ellen *et al.* (1996)	HIV risk
Kaplan and Shayne (1993)	STD risk
Hansen, Raynor and Wolkenstein (1991)	Substance abuse risk

Smokers' have a heterogeneous perception of smoking than non-smokers (Lynch and Bonnie 1994), resulting in ignoring undesirable effects (Weinstein, Marcus and Moser 2005) and believing problems can be cured easily (Krosnick *et al.* 2006). Harris *et al.* (2007) expressed that smokers who witness a graphic warning respond in a defensive manner and downplay the chance of suffering the issues highlighted in the advertisement thus disregarding health-related messages that are too fearful (Keller 1999). This is the 'risk denial' process; Smokers' have difficulty to simultaneously acknowledge the presented damaging effects that outweigh the perceived benefits from regular smoking (Peretti-Watel *et al.* 2007). The compilation of the adolescent

fallacy, smokers' optimism, increased vulnerability, and the reluctance to acknowledge the risks of smoking presents difficulties for public health practitioners that try to encourage healthy behaviours.

Policy implications for anti-smoking

Adolescent smoking is a persistent public health problem (Unger and Rohrbach 2002; Chang *et al.* 2006), with numerous policies placing special attention on adolescents due to high cigarette consumption rates (Krugman *et al.* 1994). Prevention of adolescent smoking initiation is a priority identified by health research (Institute of Medicine 1994; Pierce and Gilpin 1996), as 'the inability to curb cigarette use represents the worst public health failure in history' (Blum, Solberg and Wolinsky 2004; p. 97). Thus preventing initiation remains a public health priority (Choi *et al.* 2001; Holm, Kremers and de Vries 2003; Leatherdale *et al.* 2006), with smoking being one of the most important social problems that marketing scholars should conquer (Petty and Cacioppo 1996). The adolescent smoking phenomenon has catalysed an increase in legislation promoting more smoking prevention programmes (de Vries 1995; Tanner *et al.* 2008); as every effort should be made to try to change the image of smoking (Hoving, Reubsaet and de Vries 2007). This illustrates the greater pressures on policy makers to create effective messages to reduce dangerous behaviours (Rollnick, Mason and Butler 1999), in particular smoking.

Policy makers and governments' frequently use warning labels and graphic images to inform the public about the health consequences of smoking (Strahan *et al.* 2002; Ruiter and Kok 2005). Although the European Union advised warning label message text to be accompanied with graphic illustrations of the dangers of smoking (Holm,

Kremers and de Vries 2003), policy makers need to recognise the limitations of warning labels and focus their attention on developing other methods to reduce smoking initiation (Ruiter and Kok 2005). Although two thirds of smokers reported to obtain their information about health information from cigarette packets (Hammond *et al.* 2004), text only messages are not effective at reducing adolescent smoking rates. Only 6% of the adolescent smokers sampled in Moodie, MacKintosh and Hammond's (2010) study indicated the warnings reduced cigarette use contributing to the unsubstantial evidence about the efficacy of using warning labels (Hammond *et al.* 2004). As sizable proportions of adolescent smokers are not seeing, reading, or remembering cigarette warning labels (Robinson and Killen 1997) this method alone will not reduce uptake or cessation rates. Underage smokers acquire single cigarettes or use illegal cigarettes, rolling tobacco or e-cigarettes (Ramo, Young-Wolff and Prochaska 2015) showing the need for behaviour change principles to be applied to research to enrich social marketing behaviour change campaigns.

Marketing communications have the potential to counteract the positive perception of smokers promoted within adolescent peer networks (Leventhal *et al.* 1991), showing how 'anti-smoking adverts are needed as a countervailing force' (Pechmann and Ratneshwar 1994; p. 237). Following a review of nine anti-smoking campaigns, Wakefield *et al.* (2003) concluded that 'anti-smoking advertising may play a greater role in preventing the uptake of smoking among teenagers rather than promoting cessation among teenagers who already smoke' (p. 82) emphasizing the importance of research establishing how non-smokers' and smokers' are influenced by threat appeals.

2.3 Need for adolescent behaviour change research

The importance of researching adolescents is expressed in research spanning different disciplines (Wakefield *et al.* 2003) holistically stating the need to provide evidence about how adolescents' respond to behavioural prevention threat appeal campaigns (Lennon and Rentfro 2010). It is paramount to understand advertising responses (Stipp 1993), especially the factors that contribute to the effectiveness of an adolescent smoking prevention campaign (Samu and Bhatnagar 2008). Adolescent smoking interventions are of critical importance to prevent tobacco use (Winkleby, Fortmann and Rockhill 1993; Elders *et al.* 1994) as intervention materials can educate adolescents' about the risks of smoking in school environments (Godin *et al.* 1992; Goldberg *et al.* 2006). There is very little published work on the effects of health warnings on adolescents' smoking related attitudes and behaviours (Robinson and Killen 1997; Crawford, Baich and Mermeistein 2002; Ho 1994; O'Hegarty *et al.* 2006; White, Webster and Wakefield 2008). Although research has shown no differences between adolescent genders views towards smoking (Health and Social Care Information Centre 2014). There is a need to research adolescents' responses to different anti-smoking threat appeal communications, especially the difference between non-smoking and smoking adolescent responses.

Tobacco prevention is regarded in the top three priorities for health interventions, with emphasis placed on interventions and marketing methods implemented in schools with adolescents (WHO 2003; PHE 2014). Implementing early interventions prevent or delay the onset of smoking (Kelder *et al.* 1994; Glynn 1993; Glynn, Anderson and Schwarz 1991; Bush and Iannotti 1993; McVie and Bradshaw 2005) as adolescents' smoking judgements that influence intentions are formed between the

ages 9-13 (Bendelow, Williams and Oakley 1996). Prevention interventions should be implemented at significant times to prevent initial smoking experimentation (Leventhal and Cleary 1980). As Choi *et al.* (2001) stated that 'a significant increase in committed never smokers among 10-14 year olds could signify a future decrease in the number of young people who become established smokers' (p.320). One reason for the reduction in smokers at a later stage in adolescence could be attributed to their developmental level. Mellzer, Bibace, and Walsh (1984) recommended that an adequate prevention program should be tailored to an adolescents' developmental stage of cognitive maturity. This takes into account the general stages of cognitive development proposed by Piaget's (1930) and Werner's (1948) theories. Thus when creating anti-smoking marketing communications, the adolescents' stages of development and experience of the behaviour should be acknowledged to provide more efficacious behaviour change campaigns (Tian, Oei, and Baldwin 1992) showing the benefits of extending the model to include social influence factors.

Early adolescence is the optimal time to witness anti-smoking threat appeals. Young adolescents are the most sensitive age segment towards image based advertising (Fox *et al.* 1998) and most impressionable and susceptible to advertising than older more critical peers later in adolescence (Young 1990; Henley and Donovan 2003). Considering the amount of advertising on television, radio, billboards, magazines, internet and frequently in schools (Kunkel *et al.* 2004; Moses and Baldwin 2005; Roberts, Ulla and Rideout 2005) research into the effectiveness of anti-smoking threat appeals advertisements in school settings will provide valuable insights. It is regarded that messages designed to influence adolescents may require to be marketed through other delivery options rather than solely television media. This supports the need to provide materials such as a threat appeal stimuli that can be used offline or online,

particularly through paid online advertising that can be segmented using behavioural targeting which identifies segments based on selection criteria such as online search history, demographic information or even behaviours (Khobzi and Teimourpour 2015).

Adolescent anti-smoking research

It has been suggested that anti-smoking interventions should be implemented before 12 years of age (Kelder *et al.* 1994) as adolescents' perceptions of smokers alter between 10 and 12 years of age that forms a predictors of smoking onset at 15 years (Dinh *et al.* 1995). This shows that targeting adolescents before turning 14 years old presents an opportune time for prevention and intervention methods to be implemented (Choi *et al.* 2001). Previous research has identified that anti-smoking advertisement targeting adolescents have focused on numerous areas. Although there is no consistent conclusion about which type of advertisement content reduces intentions the most (Pechmann and Goldberg 1998; Smith and Stutts 2006). A number of studies that support the importance of targeting adolescents are briefly described in Table 2.2.

Table 2.2 Adolescent anti-smoking studies

Study	Findings
Siegel and Biener (2000)	A 4 year longitudinal study on adolescent smoking behaviour and intentions was conducted between two samples aged 12-13 and 14 -15. 12-13 year olds showed a higher recall, more positive intent to acknowledge the messages and lower intentions to smoke at recall stage, whereas 14-15 year olds had no recall of the advertisements and higher intent to smoke.
Pechmann and Chuan-Fong Shih (1999)	Priming adolescents with an anti-smoking advert before witnessing a film counteracted the positive effects characterised by the smoker expressed by those not primed prior to exposure.
Pechmann (1997)	Pupils in early secondary school had a greater response to anti-smoking adverts, whereas older pupils in secondary school had stronger smoking beliefs and disregarded the anti-smoking messages showing as adolescents' progress though secondary school their perception of smoking and smokers develops.
Aloise-Young *et al.* (1996)	7% of the 1'222 participants (aged 10-14) reported to start smoking between ages 10-12 but increased to an average of 15% who started smoking each year afterwards.
Dinh *et al.* (1995)	Positive perceptions at 10 years predicted smoking onset at 15 years more than positive perceptions at 12 years.
Botvin, Botvin and Baker (1983)	14 year olds were shown to have a more positive social image of smoking than younger adolescents aged between 11-13 years old.

Messer *et al.* (2011) implemented a smoking prevention program directed at adolescents aged 11-14 that showed how interventions counter the pressures put upon young adolescents as they enter secondary school. Similar programs run in the UK, the ASSIST scheme is based on selected pupils aged 12-13 preaching to peers about the risks of smoking, among other risky behaviours (Langford *et al.* 2014). This scheme is problematic as it misses the opportunity when adolescents enter secondary school aged 11 and is not a holistic program. Ideally an intervention should be conducted with all the adolescents on entering secondary school aged 11.

Although a lot of research investigates and signifies the necessity of communicating potential health risks to adolescents through marketing (Miller *et al.* 2006). Research must focus on a specific age segment, rather than the holistic 'adolescent' age group referred as a global segment (Hassana and Katsanis 1991; Kjeldgaard and Askegaard 2004). A concise localised sample provides recommendations about the effectiveness of tailoring interventions to suit specific subgroups of adolescents (Holm, Kremers and de Vries 2003; Pechmann *et al.* 2005) which would provide applicable results to a specific adolescent population (de Vries *et al.* 2006). Tailoring health educational messages to suit the different stages of adolescence and the different stages of smoking experimentation would increase the effectiveness of each health message.

There are various studies that provide evidence that targeting adolescents below 14 years old presents a strategic time to implement prevention and interventions (Choi *et al.* 2001). This research provides contributions towards a specific age segment that is heavily targeted by Public Health England's 'starting well' initiative (PHE 2014). Providing findings that distinguish between adolescent non-smoker and smoker samples will emphasise the importance of tailoring social marketing based on smoking classification, with particular emphasis on targeting adolescents before

smoking experimentation. This research fills the gap regarding adolescents' responses to counter advertising campaigns and how anti-smoking beliefs, attitudes and behavioural intentions are influenced. To the best of the author's knowledge 11-13 year olds responses to social and physical threat appeals between smoking behaviour classifications has not been investigated. Traditional anti-smoking communications promote cessation; no research targets vulnerable adolescent non-smokers or experimenting adolescent smokers to reduce initiation through monitoring smoking intention and smoking attitudes. In order to establish a way to prevent smoking initiation and promote cessation among young adolescents there is a need to 'understand what types of tobacco counter-marketing adverts are effective among adolescents' (Murphy-Hoefer, Hyland and Rivard 2010; p. 373). It is important to investigate adolescents as younger smokers' have stronger anti-smoking attitudes than older smokers (Ross and Perez 1998), showing that although experimenting and classified as a smoker, intentions and attitudes are impressionable being in the early stages of smoking contemplation. Priority should be focused on reducing the amount of new smokers, rather than stopping those who already smoke (Hu, Lin and Keeler 1998). Anti-smoking campaigns that are successful at preventing initial trial offer considerable benefits (Tangari *et al.* 2007) and can prevent adolescents progressing to become a contemplated experimenter smoker (Kremers, Mudde and de Vries 2004). The research provides support to investigate young adolescents and an opportunity to investigate the differences between non-smoker and smoker factors that estimate smoking behaviours and responses to threat appeals which has not been done before outlined in the hypothesis corresponding to the first proposition proving that:

Proposition #1; 'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'

This phase of the research provides comparative findings between samples exposure presenting innovative research into how alternative threat appeals influence behaviour and the difference between adolescent non-smokers' and smokers' responses to threat appeals which have not been comparatively investigated before.

2.4 Threat appeal and emotion responses to advertising

The influence of emotions holds an important position in the marketing domain (Niazi, Ghani, and Aziz 2010) and continues to capture the attention of marketing academics and public health practitioners (Cho and Stout 1993; Hutcherson and Gross 2011). Although 'emotional appeals represent an area neglected by marketers, it remains at the heart of the discipline' (Bagozzi, Gopinath and Nyer 1999). The importance of integrating emotional appeals into advertising was expressed by Maclnnis and Stayman (1993). It is suggested that an advertisement that induces a negative emotion has the ability to influence attitude and behaviour (Ghingold 1981; Maddux and Rogers 1983). This assumption explains the prominent use of emotion based persuasions within health marketing (Maddux and Rogers 1983; Stein and Levine 1990; Tanner, Hunt and Eppright 1991; Schoenbachler and Whittler 1996; Pechmann *et al.* 2003; Ruiter *et al.* 2003; de Hoog, and de Wit 2005; Smith and Stutts 2006; Zhao and Pechmann 2007; Dickinson and Holmes 2008; Michaelidou, Dibb and Ali 2008). The need to research emotional responses to advertisements is well documented throughout the literature (Stout and Leckenby 1986; Fisher and Dubé

2005), as an emotional response is 'considered as an integral, possibly central, aspect of the communication activity' (Zeitlin and Westwood 1986; p. 35). Recent research has investigated how emotions influence advertising effectiveness (Poels and Dewitte 2008; Gropell-Klein 2014). Considering emotions can aid the communication of a message (Zeitlin and Westwood 1986), and 'mediate cognitive and behaviour reactions to advertising stimuli' (Poels and Dewitte 2008; p.63), understanding how emotional processing impacts the interaction with advertising stimuli provides valuable insights (Potter *et al.* 2006). Emotional responses are regarded to operate on a dual, independent motivational system (Cacioppo and Gardner 1999) which results in either avoiding or accepting the stimuli (Potter *et al.* 2006). This is central to public service advertisements that are 'designed to evoke negative and empathetic emotions which have a positive, rather than a negative influence on attitude formations (Moore and Harris 1996; p.24). It is common practice to combine the proposed positive behavioural content with a threatening situation (Ruiter, Abraham and Kok 2001) being emotionally aversive (Agrawal, Menon and Aaker 2007). Health practitioners frequently illustrate the negative aspect of behaviours through a threat in the advert (Arthur and Quester 2004) due to the highly persuasive and influential abilities of including a threat appeals (Tomkins 1963; Quinn, Meenaghan and Brannick 1992).

The prevalent method to promote an emotional response is through a threat appeal advertisement that has the ability to influence consumer decision making through visual and emotional imagery (Kim 2006). Threat appeals are a 'psychoactive' advert that consists of persuasive messages using threatening events to promote physiological, cognitive and emotional responses to influence behaviour intentions (Sternthal and Craig 1974; Hyman and Tansey 1990; Taylor 1991; Schoenbachler and Whittler 1996; Dillard and Peck 2001). Threat appeals operate on the basis of creating

an emotional response that influences a coping response, which has been shown to influence attitude and behavioural intentions (Lazarus 1968; Scherer 1988; Rossiter and Jones 2004; Dickinson-Delaporte and Holmes 2011). Ultimately, threat appeals 'describe the unfavourable consequences that may result from the failure to adopt the communicator's recommendations' (Rogers 1975; p. 94). Operating on the basis that behaviour change is influenced by an increased arousal from observing a threatening communication (Rosenberg 1956) which promotes precautionary motivation and self-protective action (Ruiter, Abraham and Kok 2001).

A concept that provides a greater understanding of how threat appeals attract attention is known as negative bias. This theory operates with the assumption that negative events have the ability to stimulate stronger, quicker, and more cognitive, emotional and social responses than neutral or positive events (Taylor 1991). According to the negative bias theory, greater reactions occur to a negative, rather than a positive stimulus (Cacioppo and Gardner 1999) which provides the theoretical underpinning of threat appeals. Vaish, Grossmann, and Woodward (2008) described that young adolescents' pay greater attention and are more influenced by negative rather than positive factors in their environment. This shows how negative bias provides an important evolutionary and developmental function, with the ability to drive attention and engagement to a stimulus (Peeters and Czapinski 1990).

Throughout the twentieth century threat appeals have been widely adopted throughout the marketing industry (Pollay 1985), partly because they are 'one of the most frequently used motivators to get people to help themselves' (Bagozzi and Moore 1994; p.56). Although heavily debated, the increased amount of threat appeals implemented in marketing campaigns is to enhance the persuasiveness of the advertisements (Quinn, Meenaghan and Brannick 1992; LaTour, Snipes and Bliss

1996). The synergies with health communications predominantly involve either 'giving people more information; or getting people to change their behaviour' (Menon, Block and Ramanathan 2002; p. 547). The goal of threat appeals is to influence attitudes and intentions, thus helping the acknowledgement of the negative threat and overcome it, not avoid it (Potter *et al.* 2006). Threat appeals are used to communicate diverse social concerns and 'address the most pressing public health issues' (Witte and Allen 2000; p. 592). Table 2.3 describes a selection of the broad range of research with threat appeals to influence positive behaviour change.

Table2.3 Selection of health areas researched with threat appeals

Study	**Health area researched**
Insko, Arkoff and Insko (1965); Smith and Stutts (2006); Dickinson and Holmes (2008)	Stop smoking advertisements.
Michaelidou, Dibb and Ali (2008)	Cosmetic effects of smoking.
D'Silva and Palmgreen (2007)	Anti-drug public service announcements.
King and Reid (1989); Hastings, Stead and Webb (2004)	Drunken driving
Donovan, Jalleh and Henley (1999)	Road safety
Schoenbachler and Whittler (1996)	Heart disease, cancer, physical injuries.
Schafer *et al.* (1993)	Food safety
Tanner, Hunt and Eppright (1991)	Sexually transmitted diseases
Campis, Prentice-Dunn and Lyman (1989)	Protection of others
Janis and Feshbach (1953)	Dental hygiene

Considering the concept is researched across numerous contexts by health marketers, guidelines are needed about how to use threat appeals and what emotions to manipulate (Burnett and Wilkes 1980). The limitations need to be acknowledged to provide an improved understanding of how to implement behaviour change campaigns using threat appeal communications. Although there is a diverse amount of research that investigates the effects of threat appeals and subsequent responses (Floyd, Prentice-Dunn and Rogers 2000; Ruiter, Abraham and Kok 2001), there is no consensus about the most effective content to promote certain responses (Block and Keller 1995; LaTour and Ford 2006), or information about the effectiveness of using threat appeals (Potter *et al.* 2006). This shows the need to investigate how an emotional response influences acceptance or resistance towards a threat appeal (Swee and Sharon 2000). This outlines the gap that there is limited knowledge about how adolescents' respond to anti-smoking social and physical threat appeals that elicit a multitude of emotions including physical or social emotional responses.

The type of arousal, response and behavioural intentions investigated has varied ranging from; attitude towards the advert, attitude towards the brand, coping responses, emotional responses, and other arousal factors (Tanner, Hunt and Eppright 1991; Henthorne, LaTour and Nataraajan 1993; Laroche *et al.* 2001; Dickinson and Holmes 2008). Considering there is no agreement about the most effective response to monitor or influence behavioural change (Arthur and Quester 2004; LaTour and Ford 2006; Schmitt and Blass 2008). Future research should use other factors that influence adolescents' behaviour, intent and attitude; for instance, how attitude towards the advertisement actually influences future intentions and behaviours (Jung and Villegas 2011).

The efficacy of health related threat appeals is debatable (Witte 1992; Dillard 1994; LaTour, Snipes and Bliss 1996; Ruiter, Abraham and Kok 2001), as the concept is often described as 'confused and confusing' (LaTour and Rotfeld 1997; p.45). The numerous findings highlight the need to research threat appeals with different contexts and samples (Tanner 2006; Sabbane, Bellavance and Chebat 2009). An improved understanding of threat appeals is important to improve campaign effectiveness (Keller and Block 1996). It is not advised to apply results from one health promotion research to a different area because the findings are context and situation specific (Rotfeld 1988; Goodall and Appiah 2008). Although a major challenge is that there is no guarantee that information is interpreted as desired (Maloney, Lapinski and Witte 2011) or adequately processed (Raghubir and Menon 1998). Blosser and Roberts (1985) described that an advertisement message can achieve a number of objectives, namely *to* inform, *to* teach, 3) *to* entertain, *to* sell, and *to* persuade. The research focuses on how a static threat appeal can influence adolescents' intentions, attitudes and responses with an emphasis on how *to* inform, *to* teach and *to* persuade adolescents to disregard the behaviour of smoking.

2.5 Threat appeals content

Although the perception of a threat is seen to strengthen the observer's intentions to adopt the recommended behaviour (Rogers 1975; Rippetoe and Rogers 1987), new empirical and theoretical evidence is required. Kidwell *et al.* (2011) recognised the need to investigate how different facets can affect persuasiveness. These include the type of threat (Schoenbachler and Whittler 1996; Smith and Stutts 2006), perceived level of threat (Janis 1967), emotional response (Dickinson and Holmes, 2008) and

message processing, such as attitude towards the advert (Laroche *et al.* 2001). The physical emotion of fear has held a role in all theoretical approaches (Dillard 1994; Witte 1994; Keller and Block 1996). This is due to the association with message rejection (Janis 1967; Leventhal 1970; Witte 1994) regarding fear to be more memorable than upbeat adverts, with high levels of fear being shown to influence a greater change in attitude (Montazeri and Mcewen 1997; Snipes *et al.* 1999). This show that other emotions than fear alone influence message processing leading to involvement need further exploration. It is paramount to examine the structure and content of threatening marketing communications to understand responses (Witte 1992; Kees *et al.* 2006). The type of message, content and image has been heavily investigated throughout the literature (Pechmann *et al.* 2003) presenting various debates about the most appropriate; content, type of message, image, threat, level of threat, targeted response, and behavioural intent (Schoenbachler and Whittler 1996; Pechmann *et al.* 2003; Dickinson and Holmes 2008; Tanner *et al.* 2008). Research is needed as there is little guidance from the literature about the best way to create a threat appeal (Burnett and Wilkes 1980), especially how to influence adolescents smoking behaviour through social marketing (Petty and Cacioppo 1996).

Type of threat

Although threat appeals have been heavily investigated, the majority of research has focussed on physical threats (Smith and Stutts 2003), with little research on social threats (Sternthal and Craig 1974). The assumption that physical threats are more realistic and persuasive than social threats has led to the increased amount of research (Smith and Stutts 2003; Henley and Donovan 2003). Singular threat appeals have

been traditionally investigated, but recent claims state it is beneficial to investigate both threats simultaneously (Schoenbachler and Whittler 1996). Now discussions about social and physical threats are increasingly in the literature (Laroche *et al.* 2001; Smith and Stutts 2003; Dickinson and Holmes 2008). There is a need to investigate the differences between social and physical threats, as the lack of empirical evidence describes which type of threat promotes higher levels of message acceptance (Agrawal, Menon and Aaker 2007; Dickinson and Holmes 2008).

There are many contradictions about the most effective threat to use in anti-smoking public service announcement. Some research suggests adolescents' are responsive to messages about the serious health consequences of smoking (Biener *et al.* 2004; Terry-Mcelrath *et al.* 2005). While other research dismisses the belief that adolescents' are concerned by health consequences of smoking due to 'the narrow focus on health risks associated with smoking may not be optimally effective with adolescents (Strahan *et al.* 2002; Crawford, Baich and Mermeistein 2002). Considering some research states that adolescents' are less likely to value health than adults, health messages may be irrelevant (Strahan *et al.* 2002) but worth investigation. Although research with adults is not generalizable to adolescents, findings concluded that adults were influenced by beliefs about the negative health consequences of smoking, whereas adolescents' are influenced by negative social consequences (Chassin *et al.* 1991). The compilation of mixed results shows the need for comparative research between social and physical threat contents with adolescent non-smokers and smokers.

Since the seminal threat appeal study by Janis and Feshbach (1953) health concerns have been prevalent in threat appeal research. There has been a recent rise in research suggesting that threats should also target social issues (Grover and Kamins 2008), as

substantial evidence suggests social dimensions of smoking are more influential among adolescents (Ho 1998). The different types of threat appeals are expected to influence behaviours in different ways; physical threats are expected to promote a greater physical emotional response, perceived level of threat and perceived threat that will be most influential for non-smokers. The reason for this is due to smokers' optimistic bias that the physical threat will not affect them. Consequently the social threats are identified to be of greater relevance to smokers due to the immediate threat of social rejection being greater than the prospective health concerns from smoking. Considering adolescents' susceptibility to peer pressure is prevalent at influencing behaviour (Conrad, Flay and Hill 1992; Chassin *et al.* 1990; Alexander *et al.* 2001; Messer *et al.* 2011), the concern of peer rejection would influence a greater response among smokers due to increased relevance.

a) Physical threats and implications

Physical threats have been heavily used in advertising to illustrate the physical factors central to a threat, although the health risks of smoking have traditionally been the core content, research on attitude and persuasion suggests that focusing on a negative health risk could be too narrow for marketing methods (Leventhal 1970). Message processing occurs more intently when information is received about a new or unfamiliar health threat (Rothman and Salovey 1997), showing why non-smokers' will have greater levels of message processing than smokers'. Considering adolescents' disregard long term threats, health threat appeals have been regarded as inappropriate (Frankenberger and Sukhdial 1994), yet inconclusive to assumptions, Henley and Donovan (2003) concluded that younger smokers' responded more to health threats than adults reinforcing the need to investigate how physical threats

influence the specific sample of young vulnerable adolescent non-smokers' and smokers' responses.

Anti-smoking threat appeals predominantly concerns health related issues, describing long term health problems such as cancer, lung disease and ultimately death (Schoenbachler and Whittler 1996; Henley and Donovan 2003). Issues such as lung cancer, gum disease or a near fatal injury often appear as an unrealistic occurrence to adolescents with recent findings suggesting death threats are not an effective threat (Henley and Donovan 2003) having been used by over half of the physical threat appeal studies concentrating on fear arousal (Henley and Donovan 1999). The effect of smoking on teeth has been used as a physical threat content and regarded to be influential (Goodall and Appiah 2008) with adolescents' feeling susceptible to health consequences regarding their teeth and short term cosmetic effects (Smith and Stutts 2003). These types of physical threats could be classified as being more effective than other negative health warnings (Strahan *et al.* 2002) as the 'fear of social disgrace could be a stronger fear appeal' (LaTour and Rotfeld 1997; p. 25). The perceived level of threat towards the physical threat would be expected to be the greatest for non-smokers due to processing the message more intently (Rothman and Salovey 1997) due to reduced levels of involvement which influences an increased emotional response that impacts coping response and subsequent behavioural responses.

b) Social threats and implications

Social threats have been historically overlooked by research focused on physical threats; one reason for this is due to the difficulty depicting social rejection towards health contexts. There has been a rise in research investigating the capabilities of social threats (Schoenbachler and Whittler 1996; LaTour and Rotfeld 1997; Smith and

Stutts 2003 Dickinson and Holmes 2008) that are concerned with the 'intensity of social rejection' and heavily focus on peer rejection (Schoenbachler and Whittler 1996; Laroche *et al.* 2001). Social threats are perceived to illustrate an immediate threat, rather than physical threats that are prospective (LaTour and Rotfeld 1997; Kelly and Edwards 1998; Pechmann and Reibling 2000). Considering adolescents' are influenced by messages that contain social disapproval, rather than physical health consequences (Pechmann *et al.* 2003) research should investigate how interventions can promote the desirable behaviour change to a social stimulus such as peer rejection (Goodman and Southam-Gerow 2010). The stimuli needs to be relevant to age group as observational learning is enhanced when the observers believe that the person demonstrating the behaviour is a 'similar other' to themselves (Bandura 1977) increasing the relevance of social threats including adolescents. Previous anti-smoking adverts have provided preliminary evidence that threats portraying social rejection are effective (Laroche *et al.* 2001), with social norm anti-smoking advertisements being effective at lowering smoking intentions among adolescents (Worden *et al.* 1988; Flynn *et al.* 1994).

Scholars recently suggested that social threats are as equally persuasive as physical threats when targeting particular audiences regarding specific contexts (Schoenbachler and Whittler 1996; Smith and Stutts 2003), with LaTour and Rotfeld (1997) states that the optimal type of threat to influence adolescents would be a social threat over a physical threat. One explanation is that social threats contain a threat that promotes a response related to the immediate relevance of the threat which is absent from future predicted physical threats (LaTour and Rotfeld 1997). Support for using social threats is based on the assumption that anti-smoking adverts targeting adolescents should emphasize images close to their beliefs (Sabbane, Bellavance and

Chebat 2009) which result in higher levels of cognition due to the greater relevance of the content (Dickinson-Delaporte and Holmes 2011). This would suggest that adolescent smokers' will be more influenced by social threats due to the relevance of the threat appeal implying that smoking causes peer rejection. Considering the limited empirical evidence to support the assumptions (Sternthal and Craig 1974; Schoenbachler and Whittler 1996; Smith and Stutts 2003); the knowledge that adolescents' are influenced by social issues including peer approval, and that future based health threats are not relevant to the age group (Ho 1998) presents an exciting opportunity for research. Anti-smoking advertisements need to be tailored to suit the target segment. For instance, previous research with adolescents' has shown greater responses to adverts containing bad breath and stained teeth than cancer (Uusitalo and Niemela-Nyrhinen 2008) which illustrates the need to investigate the differences between social and physical threat appeals.

2.6 Previous threat appeal research

There are a number of threat appeal studies that focus on how to use coping response and the emotion of fear towards threat appeals to understand how to influence public health issues. Table 2.4 provides a summary of some of the research conducted using threat appeals, with findings relating to the level of 'fear' elicited from witnessing the threat appeal.

Table 2.4 Previous threat appeal and 'fear' arousal research

Study	Context	Finding
Bennett (1996)	AIDs	Low fear best for high self-esteem subjects but high fear best for low-self-esteem subjects.
Witte and Morrisson (1995)	Condom usage	Low fear most effective in changing attitude towards condom use.
Witte (1994)	AIDs	High fear most effective in attitude change.
Hill (1988)	AIDs	Moderate fear appeals were better than low or high fear appeals.
Burnett and Oliver (1979)	Health Insurance	High fear caused greater attitude change but in 50% of the segments researched.
Leventhal *et al.* (1967)	Smoking	High fear resulted in greater intentions to quit but no change in actual behaviour.
Leventhal and Niles (1964)	Smoking	High fear was more influential at persuading people to stop smoking.
Janis and Feshbach (1953)	Dental Hygiene	Moderate fear was most persuasive

Although numerous health issues are investigated with the fearful response to threat appeals, Table 2.5 provides anti-smoking specific research. It is widely recognised that graphic warnings are an effective tobacco control strategy (Bauer *et al.* 2000; Erceg-Hurn and Steed 2011). The evidence supports the need to analyse the differences between social threat and physical threats with a segmented population of adolescents. Considering no research provides the differences between non-smokers' and smokers' responses, there is a need to develop the existing threat appeal and behaviour models to estimate behaviour intentions and attitudes post exposure.

Table 2.5 Anti-smoking threat appeal studies

Study	Sample and model	Manipulations	Findings
Michaelidou, Dibb and Ali (2008)	325 students aged 11-14, No conceptual model tested. Scales used to record responses. Print Adverts	*Short term cosmetic and physical Versus Long term health related anti-smoking information.*	Information about short term effects of smoking (yellow teeth, smelly clothes and fitness) has greater impact on beliefs than long term. Behaviour not tested.
Dickinson and Holmes (2008)	353 students aged 14-16, No model tested. Scales used to record responses. Print Adverts.	*Social Versus Physical Anti-Smoking Threats, Coping response, Combined emotional response.*	Social threats promote stronger adaptive coping response than physical threats. Disgust was the only emotion to be correlated to an adaptive coping response and physical threats promoted the greatest emotional response. Does not test behaviour.
Arthur and Quester (2004)	293 students aged 19-21, Extended the protection motivation model. Scales used to record behaviours. Print Adverts	*Physical Versus Social Anti-Smoking Threats, Coping Responses, Moderating role of Self-Efficacy, Mediating role of Fear*	Fear was shown to mediate between probability of occurrence and behavioural intentions. Further research needed to develop the model and role of coping response to fearful appeals. Behaviour weakly tested.

Pechmann *et al.* (2003)	1667 students aged 12 to 16. Protection Motivation theory tested on 194 anti-smoking adverts. Scales used to record responses Video adverts.	*7 message themes tested relating to anti-smoking advertising. Behaviour intentions, Heath risks perceptions, social risk perceptions, efficacy, cost and benefit perceptions measures were obtained.*	3 of 7 message themes increased adolescents' non-smoking intentions by proving that smoking poses severe social disapproval risks. Health risk severity may cause an increased risky behaviour among those that view themselves invincible.
Eppright *et al.* (2002)	145 University students. Ordered protection motivation model tested. Scales used to record responses.	*Level of threat, Coping response scale, fear response, behaviour intentions,*	Greater the perceived level of threat the greater the fear, with fear being related to avoiding the threat and a maladaptive coping response. States the importance of understanding coping response over perceived level of threat or fear.
Smith and Stutts (2002)	235 students aged 14-16, No conceptual model tested. Scales used to record behaviours. Print Adverts	*Short term cosmetic Versus Long term heath, covariates were gender, peer pressure and parental smoking. Dependents were change in smoking behaviour and change in self-classification.*	Short term cosmetic threats were more effective for males, but long term were more effective for females with the average smoking declining 5 months after exposure. Behaviour tested over 5 months.
La Tour, Snipes and Bliss (1996)	305 female adults. No model tested. Scales used to record responses. Video adverts.	*Strong Versus Mild fear appeals, Intentions, Attitude towards the advert and the brand.*	The stronger the fear the more persuasive the advert intentions.

The studies show that although social and physical threat appeals have been investigated, there is no consensus about how to influence adolescents. Threat appeals research has included a broad range of participants, particularly anti-smoking research which has varied from longitudinal studies with adolescents 12-14 years old (Dinh *et al.* 1995), 15-19 years old students (Smith and Stutts 2003), students aged between 12-15 and 14-16 years old (Siegel and Biener 2000; Dickinson and Holmes 2008) undergraduate university students (Arthur and Quester 2004; Schmitt and Blass 2008) to randomly selected people in shopping centres (Henthorne, LaTour and Nataraajan 1993). Kim (2006) highlighted the need to design persuasive anti-smoking messages that are focused on adolescents as there is a lack of evidence confirming the most suitable and appropriate message theme for adolescents (Farrelly, Niederdeppe and Yarsevich 2003; Wakefield *et al.* 2003; Devlin *et al.* 2007). As advertisers, public health practitioners and policy makers face various challenges when implementing content to caution adolescents about the dangers of smoking (Fox *et al.* 1998). The importance of segmenting the sample between smokers and non-smokers provides evidence about how to communicate with adolescents' with different beliefs and attitudes towards smoking. It is important to understand the drivers that influence both segments as shown in Table 2.6.

Table 2.6 Holistic sample differences between non-smokers and smokers

Study	Findings
Montazeri and Mcewen (1997), Koszegi (2003)	Smokers' have a higher attitude change than non-smokers' from witnessing a fear inducing anti-tobacco advertisements.
Dijkstra, De Vries and Roijackers (1998)	Smokers' desire to quit increased when they were sent letters manipulating their perception of social pressures to quit.
Graham, Marks and Hansen (1991)	Cosmetic messages and short term health threats capitalise on adolescents' hypersensitivity to being evaluated by others.
Rogers, Deckner and Mewborn (1978)	Witnessing a threat appeals increased the number of smokers' who stopped smoking completely for a year.

There is a need to strengthen beliefs about not smoking using social marketing (Murphy-Hoefer, Hyland and Higbee 2008). Although contrary to belief, promoting a highly threatening response is not paramount to behaviour change. Hastings, Eadie and Scott (1990) stated 'scare tactics' do not work for all social marketing campaigns due to the different contexts and audiences. This highlights the importance of investigating the effectiveness of different anti-smoking threat appeals with the target segments (Siegel and Biener 2000). To the best of the author's knowledge, no research has consistently investigated how the different types of threats depicting adolescent social or physical threat concerns, alongside emotional responses, coping responses, message processing; influence pre and post exposure attitudes and intentions towards smoking among 11-13 years old. The second proposition evaluates

how the different threat appeals influence responses and addresses a number of hypotheses to establish:

> ***Proposition #2: 'Post exposure behavioural responses will be significantly different between threats'***

2.7 Perceived level of threat

The perceived level of a threat appeal and effectiveness is continuously debated (Manyiwa and Brennan 2012). Although extensive research has investigated the relationship between the level of threat and the amount of attitude and behaviour change, the results are inconclusive, inconsistent and lack support for a particular level of threat (Rotfeld 1988; Snipes, LaTour and Bliss 1999; Rossiter and Jones 2004). During the preliminary research into threat appeals a positive linear relationship between scare tactics/level of threat and attitude was championed, yet the findings are inconclusive across the literature (Witte 1992). On numerous occasions across the health context, research findings describe that a different level of threat influences behaviour. Table 2.7 provides a summary of research showing that low, moderate or high perceived level of threat has been shown to influence behaviour and responses to threat appeal advertisements.

Table2.7 Level of threat most effective

Studies	Level of threat
Hovland, Janis and Kelley (1953), Gore and Campanella Bracken (2005).	Low threat regarded most effective at influencing greatest response.
Janis (1967), Janis and Leventhal (1968), Quinn, Meenaghan and Brannick (1992), Keller and Block (1996).	A curvilinear relationship that suggests a moderate level is optimal at influencing greatest response.
Janis and Feshbach (1953), Janis and Terwilliger (1962), Leventhal, Singer and Jones (1965), Higbee (1969), Sternthal and Craig (1974), Sutton (1982), Boster and Mongeau (1984), Rotfeld (1988), LaTour and Pitts (1989), King and Reid (1990), Tanner *et al.* (1991), Snipes, LaTour and Bliss (1999).	Higher the threat regarded at influencing the most persuasive response.

An up to date clarification of Janis and Feshbach's (1953) initial assumptions is needed with adolescents as the results are mixed across health contexts. Witte and Allen's (2000) meta-analysis concluded that the stronger the response to the threat appeal influenced a greater the attitude, intention and behaviour change, rejecting other level of threat theories. This claim confirms initial assumptions made by Boster and Mongeau (1984) that if the strongest level of threat appeal is most persuasive and creates the greatest response, there is no need to use lower levels being less persuasive. Research is needed to establish the level of threat and configuration of an anti-smoking advertisement to influence adolescent smoking attitude, intention and

behaviour (Wakefield *et al.* 2003). Difficulties arise when reviewing results, as the higher threat conditions promote greater attitude towards the health promotion advertisement, practitioners must recall that this does not directly influence behavioural intentions. Tanner *et al.* (2008) stated that it is not solely the high perceived level of threat that effects behavioural intentions, but other content aspects in the public health message. The mixed findings from research on the perceived level of threat towards threat appeals amplifies the importance of the third proposition regarding how adolescents' perceived level of threat influences post exposure smoking behaviour measures. The cluster of hypotheses is focused on achieving:

> ***Proposition #3 'The perceived level of threat will significantly influence post exposure responses to each threat condition'***

2.8 Summary

This chapter discussed the initial three research propositions. Current smoking rates and reports are provided to outline how 11-13 year old adolescents are a vulnerable and under researched segment that needs investigation due to susceptibility to forming long lasting addiction to tobacco. The need for public health advertising research is provided with discussion of how findings will provide insight into how different threat appeals influence behaviour between smokers' and non-smokers'. The content, type of threat appeal and perceive level of threat is discussed, highlighting the need for research to investigate the difference between social and physical threat appeals and how the perceived level of threat influences behavioural responses. The existing behaviour change, social learning theory, health and threat appeal models are described in the next chapter that influences the conceptual model and factors.

Chapter Three

The conceptual model, existing theories and model constructs

3.1 Introduction

This chapter outlines the conceptual model developed to estimate responses to threat appeals. Initially health models and behaviour change theories are described, followed by a summary outlining the evolution of the threat appeal models used to estimate responses to health communications in behaviour change research. An emphasis on anti-smoking is provided throughout confirming the necessity of using theory to develop adolescent anti-smoking interventions. The conceptual model is described detailing the amalgamation of aspects from behaviour change models, social learning theory, health models and threat appeal models. The chapter is concluded with an overview of the constructs included in the model and the factors ability to estimate behaviours with an emphasis on adolescent smoking outlining the final three research propositions.

3.2 Health models and behaviour change research

An important aspect of a behaviour change intervention is the theoretical origin (Tyas and Pederson 1998; Rutter and Quine 2002). Theoretical models from the social and behavioural sciences provide methods and constructs that 'enable the explanation of individual knowledge, beliefs, attitudes and behaviours' (Forthofer 2003; p. 530), to identify important variables that influence people's behaviours (Norman and Conner

2005). A greater understanding of how to predict health-enhancing behaviours will benefit health professionals and the wider society (Dickinson-Delaporte and Holmes 2011). It is important to acknowledge that interventions and communications based on behavioural change theories have longer lasting effects than non-theoretical interventions (Foster *et al.* 2005). Numerous theoretical models have attempted to explain the effectiveness of threat appeals, although the application of models to adolescents is unclear (Lennon and Rentfro 2010) with limited coverage about the ways that change occurs (Michie and West, 2013). Although Michie, van Stralen and West (2011) identified 19 frameworks of behaviour change, current models do not distinguish between emotional (arousal) and cognitive (threat perception) responses to threat appeals (Ruiter, Abraham and Kok 2001). Research has utilised a variety of theoretical models, with threat appeals addressing some of the most pressing public health issues (Witte and Allen 2000). The models concern the desire to overcome a negative health outcome by being motivated to promote self-protection (Weinstein 1989) by; preventing the onset of a health problem, detecting the development of a health problem, or treating an on-going health problem (Rothman and Salovey 1997). This research is focused on promoting health prevention behaviours which are regarded to be difficult to promote, being completely different from a cessation behaviour that views behaviour as a linear concept (Andreasen 2003).

Although inconsistencies surround the findings from threat appeal research, the ability to influence attitude and behavioural change is unchallenged (Shelton and Rogers 1981; Rogers 1983). The limitations of using conceptual models are well known, being theory based, not always empirical, with model testing being 'a tentative and imperfect picture of reality' (Bagozzi 1984, p. 26). Threat models are used to influence positive health enhancing behaviour change (Floyd, Prentice-Dunn and

Rogers 2000). The majority of threat appeal research conforms around the dominant models that aim to influence the observer to accept the health protective behaviour and disregard the dangerous behaviour (Weinstein 1993).

Although Maddux and Rogers (1983) stated that health decision making theories are suited to disease prevention over health promotion. It is important to understand the role that behavioural models have within social communications (Marchand 2010) and to examine other outcomes produced by the campaign (Witte *et al.* 1998). An understanding of the health models provides a theoretical reference point when creating a campaign, utilising the 'various health models that explain what leads people to practice good behaviours' (Ho 1998; p. 368). Tanner (2006) stated that 'very little theoretical development has occurred' with 'very little known about what influences coping responses' (p.415) which raised the importance of incorporating aspects from different models with Chassin *et al.* (1996) suggesting an opportunity to develop a model based on social theory that outlines the reasons or factors that influence adolescents' risky behaviours. A collaboration of research models using different aspects of social learning theory, behaviour change models, health models and threat appeal models will provide an innovative approach to understand coping responses, attitudes and behavioural intentions towards threat appeal public health advertisements. The different theories and models are described in Table3.1 which are briefly summarised throughout the chapter.

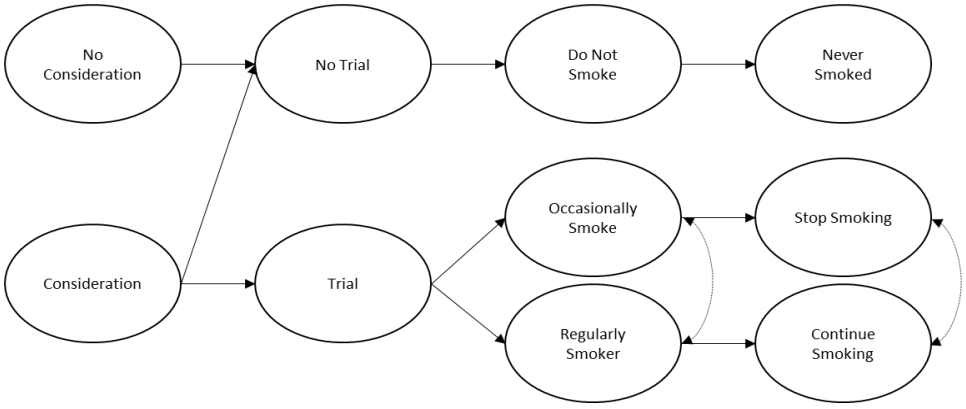
Table 3.1 Compilation of theoretical models used to estimate behaviour

Theories	Constructs included in the theoretical model
Smoking Decision Process Model, Albaum *et al.* (2002)	Stages of behaviour based on; preparation, initiation, experimentation, and maintenance.
Model of unplanned smoking initiation of adolescents, Kremers, Mudde and de Vries (2004)	Stages of commitment and experimentation based on motivation and behavioural expectations.
Social Learning Theory, Bandura (1969)	Social Norms, Subjective Norm and Role models.
ASE model, de Vries and Mudde (1998)	Attitude, Social Influence and Self-Efficacy.
Theory of Reasoned Action, Fishbein and Ajzen (1975)	Attitude towards behaviour, Subjective Norm, Behaviour Intention and Behaviour.
Theory of Planned Behaviour, Ajzen (1991)	Attitude towards behaviour, Subjective Norm, Perceived Behavioural Control, Behaviour Intention, Behaviour.
Health Belief Model, Prentice-Dunn and Rogers (1986)	Perceived Benefits versus Barriers to Change, Perceived Susceptibility, Perceived Threat of Disease, Likelihood of Behavioural Change and Cues to Action.
Fear Drive Model, Hovland, Janis and Kelley (1953)	Attention to Risk, Fear Arousal, Attention to precautionary information, Process Fear control, Threat, Response Efficacy, Self-Efficacy, Precautionary and Precautionary Action.
Parallel Processing Model, Leventhal (1970)	Emotions and Cognitive processes, Coping Response, Intentions, and Behaviour
Protection Motivation Theory, Rogers (1975)	Intrinsic and Extrinsic Rewards, Severity and Vulnerability, Fear Arousal, Response Efficacy and Self Efficacy, Response Costs, Protection Motivation, Coping Response, Behaviour.
Ordered Protection Motivation Theory, Tanner *et al.* (1991)	Perceived Threat, Perceived Efficacy, Fear arousal, Coping Response, Attitude and Behaviour.
Extended Parallel Process Model, Witte (1992)	Perceived Threat, Perceived Efficacy, Fear Arousal, Protection Motivation, Defensive Motivation, Behaviour.

Smoking Decision Model

The Smoking Decision Process Model (Albaum *et al.* 2002) describes that an adolescent progresses through stages from consideration to dependency through exposure to cigarette smoking (Leventhal and Cleary 1980; Elder *et al.* 1990). Little amount of literature is published on adolescents during the smoking decision process (Albaum *et al.* 2002) showing the need to gain information showing what influences and contributes to adolescents' intentions and attitudes towards smoking. Figure 3.1 illustrates Albaum *et al.*'s (2002) four stages, namely: (i) Preparation period, (ii) Early experimentation, (iii) Regular smoking and (iv) Stable level of addiction.

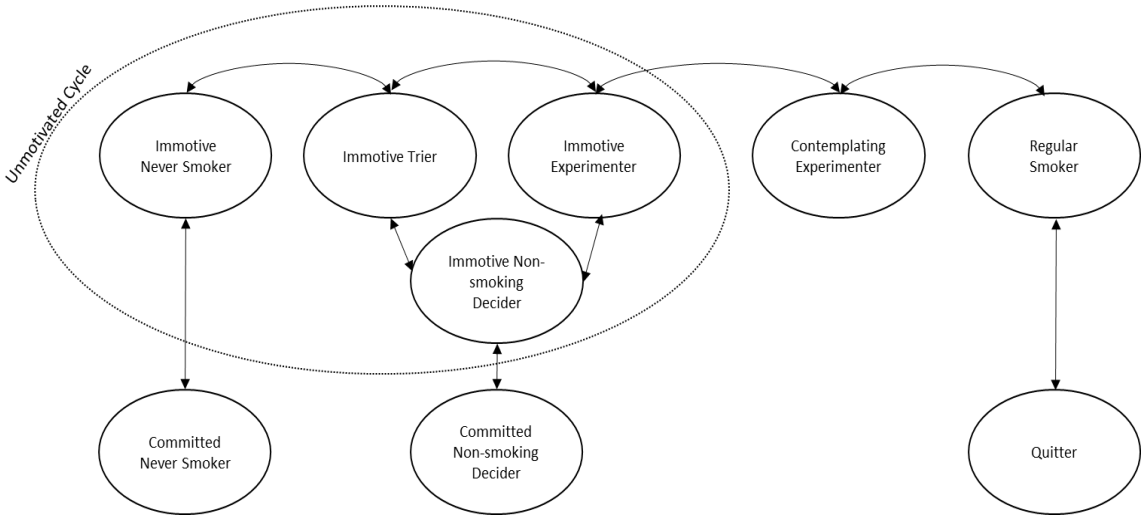
Figure 3.1 Smoking Decision Process Model
(Albaum *et al.* 2002)



Model of unplanned smoking initiation of adolescents

The model of unplanned smoking initiation of adolescents describes that the adolescents' experiment with smoking while they are in an unmotivated state regarding their plans for smoking in the future (Kremers, Mudde and de Vries 2004). Figure 3.2 shows that motivational dimensions influences smoking initiation.

Figure 3.2 Model of unplanned smoking initiation of adolescents
(Kremers, Mudde and de Vries 2004)



This research will provide two contributions for adolescents, firstly it will provide insights into the way that non-smokers will be able to prevent initiation, but also provide results specific to adolescents' who have experimented with smoking.

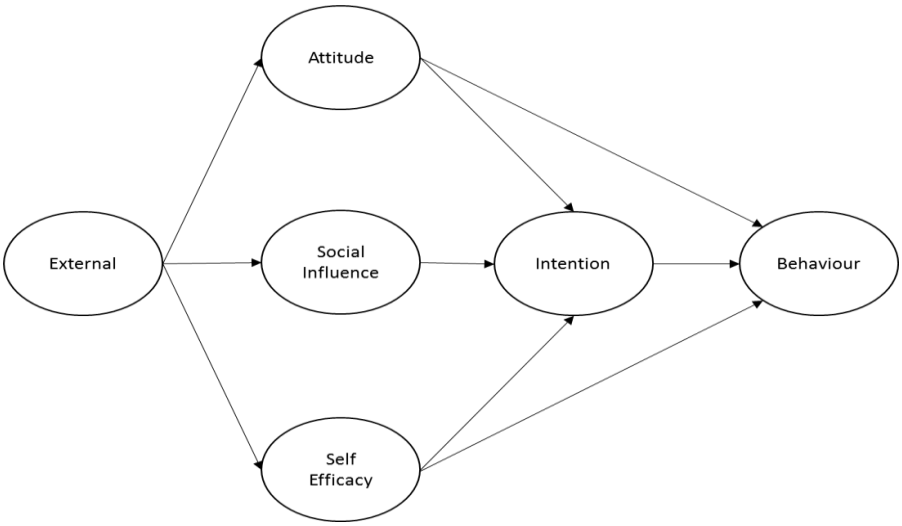
Social Learning Theory

The concept of social learning proposes that learning occurs from observing, modelling and imitating others with new patterns of behaviour acquired through direct experience or observation of other people's behaviour (Bandura 1969). The majority of adolescent learning occurs through social interaction of peers and parents being key reference groups (Bandura 1977). The importance of self-reinforcement capabilities should be considered as self-efficacy can regulate the adoption of behaviour (Bandura and Adams 1977), especially as adolescents' perceptions of social norms are formed from their peers, observing and imitating role models around them that include older siblings (Samek and Rueter 2011; Messer *et al.* 2011).

Attitude-Social Influence-Efficacy Model

The Attitude-Social Influence-Efficacy Model has been used to explain different types of health behaviour such as the onset of smoking and smoking cessation in adolescence (de Vries *et al.* 1994; Dijkstra *et al.* 1999; Kremers, Mudde and de Vries 2001) and includes attitude, social influence factors and self-efficacy as direct constituents to influencing intention and behaviour (de Vries and Mudde 1998). Figure 3.3 shows the model that suggests behaviour can be predicted by intentions which are determined by three types of cognitive factors; attitude towards the behaviour, social support and self-efficacy expectations (Holm, Kremers and de Vries 2003).

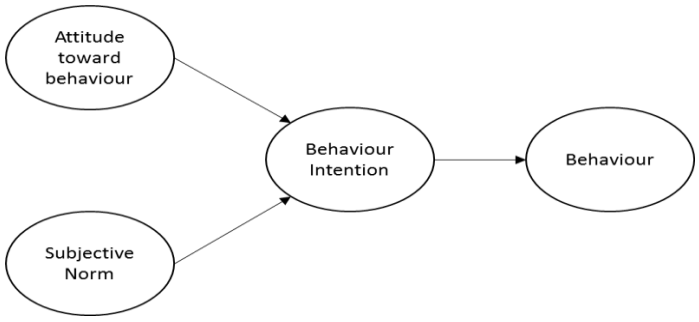
Figure 3.3 Attitude-Social Influence-Efficacy Model
(de Vries and Mudde 1998)



Theory of Reasoned Action

The Theory of Reasoned Action (TRA) aims to investigate, monitor and predict motivational influences on attitudes and behaviours (Ajzen and Fishbein 1980). The TRA is the compilation of three constructs; behavioural intentions, attitude and subjective norms with behavioural intentions being the combination of attitude and subjective norms (Ajzen and Fishbein 1980) shown in Figure 3.4. The model has been used to predict behavioural intentions and behaviours (Madden, Ellen and Ajzen 1992), and shows the need to have an attitude towards the behaviour and an attitude towards the threat appeal independently influencing intentions and behaviour.

Figure 3.4 Theory of Reasoned Action
(Fishbein and Ajzen 1975)

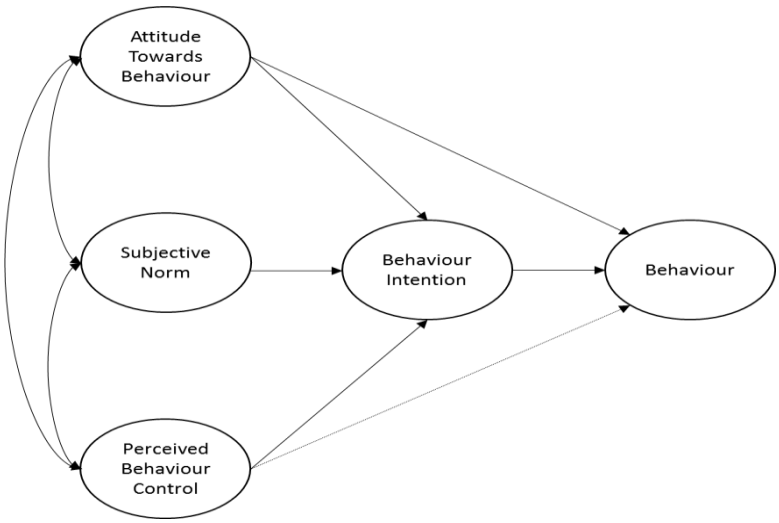


Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) is an extension of the TRA including perceptions of behavioural control as a predictor of intentions and behaviour (Madden, Ellen and Ajzen 1992). It emerged as one of the most influential and popular conceptual frameworks for the study of human action (Ajzen 2002). The TPB shown in Figure 3.5 is regarded to have a greater predictive validity than other models (Milne, Sheeran and Orbell 2000) and that there is more to influencing

behaviours than just intentions (Madden, Ellen and Ajzen 1992). Attitude towards behaviour and perceived behavioural control are synonymous with self-efficacy (Ajzen 1991) and are reported to control both intentions and behaviour (Armitage and Conner 2001). Previous research has suggested that attitudes and perceived behavioural control are influential predictors of smoking-related intentions (Murnaghan *et al.* 2009), which subsequently influence smoking behaviour (Bricker *et al.* 2007).

Figure 3.5 Theory of Planned Behaviour
(Ajzen 1991)

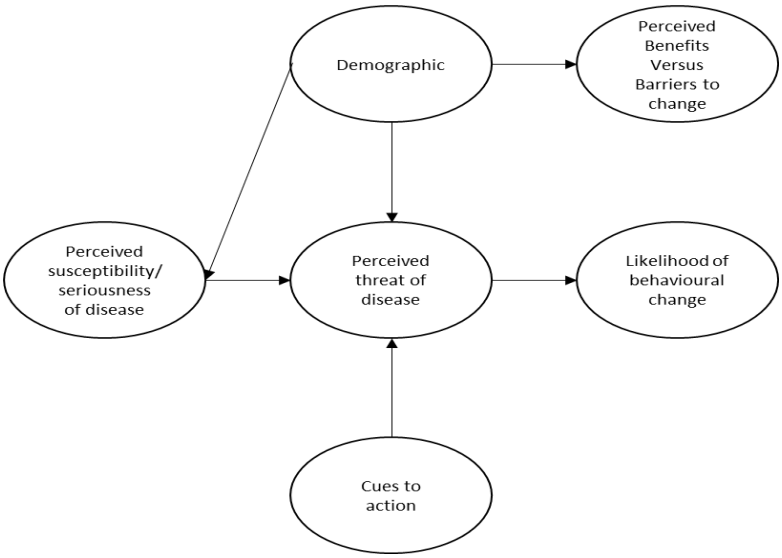


Health Belief Model

The health belief model (HBM) has been regarded as one of the most widely used psychological theories regarding health related belief behaviours (Ronis 1992), with over 1100 academic papers indexed on PubMed (Jahanlou, Lotfizade and Karami 2013). The HBM estimates health behaviours and suggests that when exposed to a threat, one searches for preventative health behaviours to reduce or expel the threat (Rosenstock 1966; Rosenstock 1974; Prentice-Dunn and Rogers 1986). The HBM has similarities to threat appeal models due to the focus on influencing a positive

behaviour change (Floyd, Prentice-Dunn and Rogers 2000). The model has had numerous iterations, but retains a structural approach to understanding behavioural responses to health practices (Campbell and Kirmani 2000) through perceived threat and perceived efficacy dimensions that are paramount to coping response regulation central to threat models (Rosenstock 1974) shown in Figure 3.6.

Figure 3.6 Health Belief Model
(Glanz and Yang 1996)

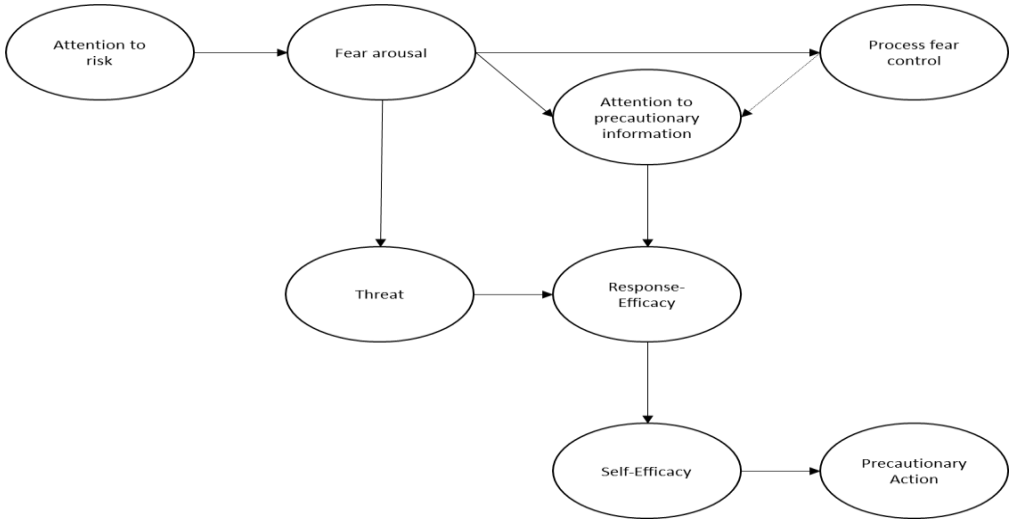


Although little guidance on the conceptual relationship between dimensions and subsequent behaviours have been provided (Rosenstock, Strecher and Becker 1988). The combination, multiplication and subtraction of these independent dimensions have been heavily debated throughout the literature (Rutter and Quine 2002). The main difference with threat appeal models being the structure (Floyd, Prentice-Dunn and Rogers 2000), there are many similarities to threat appeal models (Weinstein 1993).

Initial Fear Drive theories

The initial research into threat appeals proposed that the emotion of fear performs as a catalyst to motivate and influence actions (Witte and Allen 2000). The initial fear drive model was established by (Hovland, Janis and Kelley 1953) who proposed the fear-as-acquired drive school of thought (Janis 1967). It suggests that promoting a fearful emotional response motivates people to overcome and counteract a fear eliciting stimuli. Ultimately the fear drive model is an 'instrumental avoidance learning paradigm involving negative reinforcement' (Rossiter and Thornton 2004; p. 947). The fear drive model was the initial model in the threat appeal domain and emphasised the emotional response of fear described in Figure 3.7, which has permeated throughout all the threat appeal research models. Since inception the model has been regarded out-dated in the literature (Norman and Conner 2005) and the drive theories rejected in the 1970s due to a lack of empirical support (Rogers 1975; Beck and Frankel 1981; Rogers 1983). Although the consensus that fear promotes attitude and behaviour change, the results have provided mixed findings regarding the amount of fear promoted and the relationship between fear, attitude and behaviour change (Janis 1967; Boster and Mongeau 1984; Quinn, Meenaghan and Brannick 1992; Witte and Allen 2000). Subsequently the fear drive models have been ignored by contemporary theorists due to more applicable models (Sutton 1982; Boster and Mongeau 1984; Witte and Allen 2000) and the complex and potentially contradictory relationships between fear arousal and the promotion of precautionary motivation (Ruiter, Abraham and Kok 2001). Subsequent research has built upon the fear drive model assumptions describing perceived threat, attention and fear arousal acquire information to control fear (Ruiter, Abraham and Kok 2001).

Figure 3.7 Fear Drive Model
(Ruiter, Abraham and Kok 2001)



Parallel Processing Model

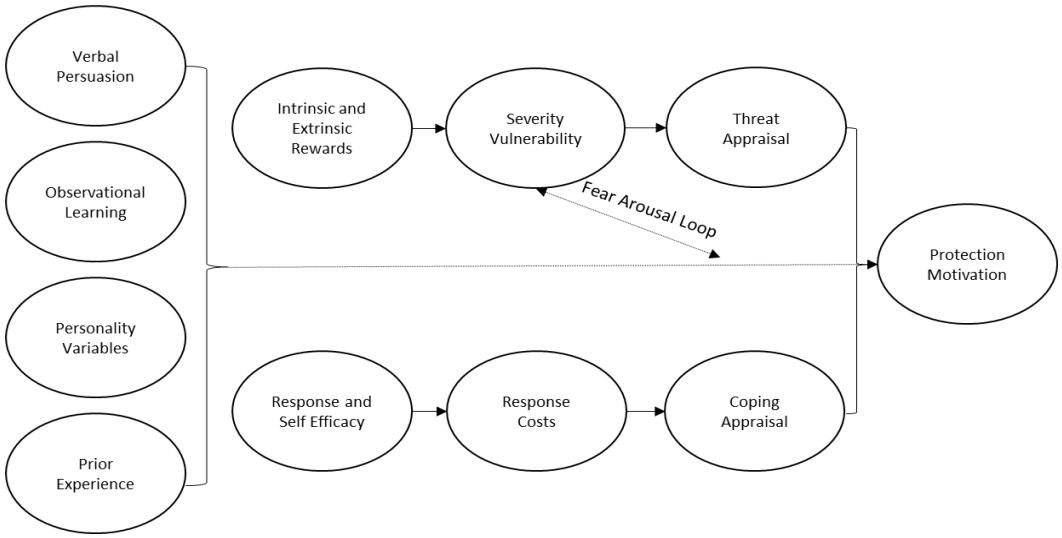
The first model post fear drive school of thought was the parallel processing model (Leventhal 1970) which suggests an emotional and cognitive process independently influences behaviour to cope with the threat (Witte and Allen 2000). Although the model was only a proposition and not empirically tested, the assumptions promoted the development of more prevalent models suggesting that threat appeals consists of both emotional processes and cognitive rational domains (Witte and Allen 2000).

Protection Motivation Theory

Rogers (1975) Protection Motivation Theory (PMT) originates from social psychology assessing behavioural intentions to demonstrate how threat appeals can influence message acceptance (Prentice-Dunn and Rogers 1986; Tanner, Hunt and Eppright 1991; Witte and Allen 2000). Rogers and Deckner (1975) extended the expectancy valance model which subsequently included reward and self-efficacy

(Maddux and Rogers 1983). This formed the concept of protection motivation which is influenced by the primary and secondary appraisal process paradigm (Lazarus 1968). This describes that threat appraisal occurs over different stages of behavioural change, describing the evaluation of threat appeals on four dimensions: split by the threat presented and levels of efficacy (Rogers 1975). This 'acts as an intervening variable that has the typical characteristics of a motive; it arouses, sustains, and directs activity' (Rogers and Deckner 1975; p. 98). Rogers hypothesised that the four factors shown in Figure 3.8 interact cohesively to influence behaviour. Although the following mixed results provide criticism to the relationship as the individual threat items are correlated with individual efficacy items (Rogers and Mewborn 1976; Kleinot and Rogers 1982; Maddux and Rogers 1983). The response of protection motivation forms the foundations of later research into coping responses.

Figure 3.8 Protection Motivation Model
(Rogers 1983)



Ordered Protection Motivation Theory

Tanner *et al.* (1991) proposed the Ordered Protection Motivation Paradigm (OPM) which claimed the four dimensions from PMT are processed systematically. This builds on previous Scherer's (1988) beliefs that the appraisal of information and outcomes occurs in a sequence. Initially appraising the threat which elicits the emotion followed by the coping response appraisal (Tanner *et al.* 1991), as 'once threat appraisal takes place, information about possible lines of coping is given urgency, or search processes relevant to coping are activated' (Lazarus 1968; p. 197). The later models provide insight into how to influence attitudes and behaviours towards threats (Floyd, Prentice-Dunn and Rogers 2000).

Extended Parallel Process Model

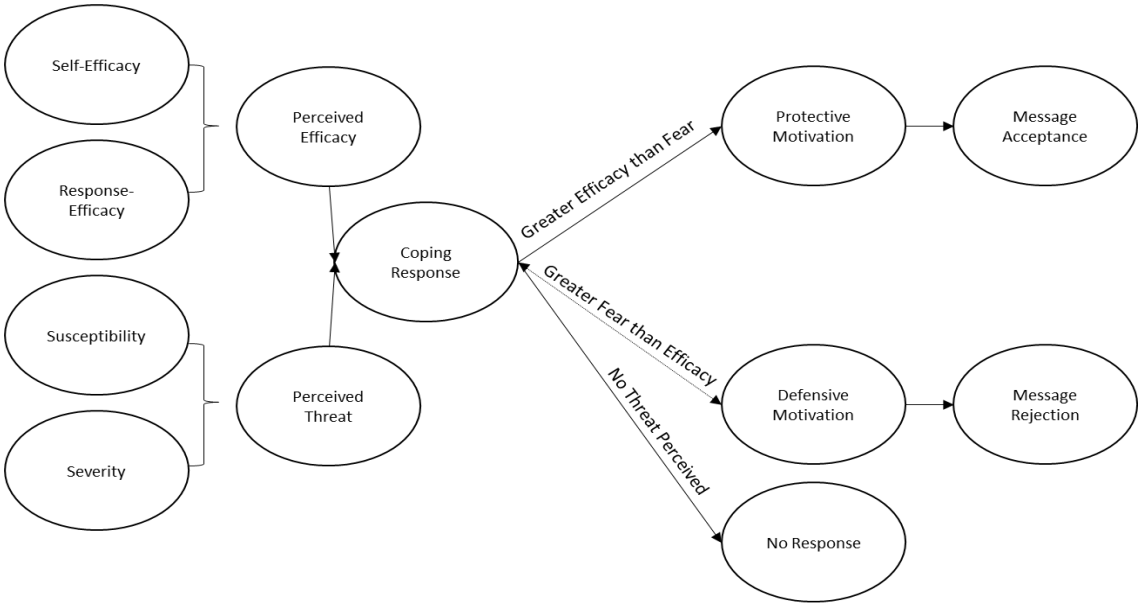
The Extended Parallel Process Model (EPPM) was created to overcome limitations from previous models (Witte 1992). The amalgamation and development of previous threat appeal theories attempt to explain the success and failure of threat appeals (Witte and Allen 2000). The EPPM has been the predominant theory in threat appeal research since inception over 20 years ago (Maloney, Lapinski and Witte 2011), providing the initial threat appeal design framework (Witte 1992). It has been used to promote a variety of health oriented behaviours including detection of skin cancer; avoidance of teen pregnancy; AIDS awareness, genital warts; awareness of hearing impairment and meningitis (Witte 1994; Witte 1996; Stephenson and Witte 1998; Witte 1997; Witte *et al.* 1998). Although being tested with different populations such as juvenile delinquents, college students and African American women (Witte *et al.*

1998; Witte 1994; Witte 1996; Witte 1992; Witte and Morrison 1995) the model has not been developed with young adolescents' responses to anti-smoking threat appeals.

Being influenced by the different threat appraisal models, the EPPM has implemented aspects of previous theories explaining responses through perceived threat and perceived efficacy (Maloney, Lapinski and Witte 2011). The Parallel Process model influences the basic framework (Leventhal 1970), Protection Motivation theory explains the danger control aspect (Rogers 1975), and the fear-as-acquired drive model influences the fear control dimension (Janis 1967). While the PM suggests message acceptance is achieved when perceived threat and coping efficacy are high (Prentice-Dunn and Rogers 1986). The EPPM differentiates between two types of motivational responses appraise the perceived threat of the message and perceived efficacy of the recommended response (Witte and Allen 2000; Timmers and van der Wijst 2007). Protective motivation leads to acceptance of threatening messages, whereas the defensive motivation results in message rejection.

Exposure to threat appeals influences two coping responses to either acknowledge the threat and overcoming it being an adaptive coping response, or to ignore the threat completely, continue the risky behaviour and only overcome the emotion presented being a maladaptive coping response (Dickinson and Holmes 2008). The model is described in Figure 3.9. A critical relationship exists between the dimensions of perceived threat and perceived efficacy predicting the ability to exert control being reliable predictors of health behaviour (Janz and Becker 1984). Perceived efficacy ultimately determines whether one can 'control the danger or control their fear about the threat' (Witte and Allen 2000; p.594) which forms a coping response central to evaluating and estimating behavioural responses to threat appeals.

Figure 3.9 Extended Parallel Processing Model
(Witte 1992)



According to the model, the threat and efficacy components must be accepted to achieve the desired behaviour termed ‘danger control’ although if the threat condition is not met, or met with low efficacy the acceptance of the threat triggers ‘fear control’ (Barnett *et al.* 2009; p. 3). The concept of fear control is proposed to be termed ‘emotion control’, as it is oriented towards controlling the emotion response elicited dependent on the threat appeal not just fear. Timmers and van der Wijst (2007) concluded that promoting genuine fearful responses did not result in more effective threat appeals. Supporting the claim that responses to threat appeals will contain more than one emotional response regardless of the threat observed (Donovan and Henley 1997). The presence of physical emotional response arousing messages is perceived to promote a defensive reaction, much like fear influencing a ‘psychological immune system’ (Thirlaway and Upton 2005; p. 104).

Emotion control describes the lack of ability or motivation to combat the threat, deny the existence or avoid the threat inducing information (Witte *et al.* 1998) and concerns

how one over comes the threat (Maloney, Lapinski and Witte 2011). Often regarded as emotion-focussing coping (Folkman and Lazarus 1985), the term 'emotion control' is primarily a process which focuses on the control of internal concerns, where people respond to and cope with their emotion, not danger (Witte 1994). The avoidance techniques propose a maladaptive coping response that suggests defensive reactions are likely to be part of the emotion control process (Gallopel-Morvan *et al*. 2011), as maladaptive coping response is largely avoidant thinking (Rippetoe and Rogers 1987). Ultimately people 'either reject the behaviour or habit, or reject the message' (Lennon and Rentfro 2010; p. 59). Studies have concluded that low perceived efficacy combined with an increased perception of threat lead to an increase in maladaptive behaviours (Rogers and Mewborn 1976; Kleinot and Rogers 1982). Low perceived efficacy influences a belief of being incapable of dealing with threat, thus emotion control will dominate; representing a maladaptive response to cope with the emotion by supressing thoughts of danger elicited which may occur automatically outside conscious awareness (Lazarus 1991).

The alternative desired response occurs when perceived efficacy is high influencing confidence to combat the threat and engage in risk-ameliorating behaviours reducing the danger (Witte 1992; Witte 1996) and deal with the threat (Maloney, Lapinski and Witte 2011) showing a behaviour to overcome the threat through passive coping (Piko 2001). Danger control processes focus primarily on the control of external concerns such as threatening stimuli (Witte 1994; p. 116) although perceived efficacy plays the crucial role in determining whether a response is adaptive or maladaptive, if one feels capable of dealing with the threat, danger control will prevail. Manipulating perceived efficacy and perceived threat forms a numerical 'coping response critical value point', when perceptions of a threat outweigh the perceived efficacy moving coping response

from danger control to fear control (Witte 1996). This represents the 'Critical Value' determining whether the emotion is overcome or the danger of the threat (Witte 1994) which is calculated by this simple formula;

Critical Value= (Z value for perceived efficacy)-(Z value for perceived threat)

When the standardised value is positive represents danger control process, whereas negative or zero describes the critical point when the emotion control route is activated (Maloney, Lapinski and Witte 2011). Perception of a high threat is paramount is due to the least amount of attitude, intention and behaviour change occurring in the low threat condition (Witte 1992) as a 'positive relationship exists between perceived risk and health behaviours' (Rimal 2001, p. 633). There is support for the critical point theory as researchers have found that threat appeals with high levels of threat and high levels of efficacy produce the greatest amount of message acceptance (Rogers and Mewborn 1976; Kleinot and Rogers 1982; Maddux and Rogers 1983; Witte 1992; Witte and Allen 2000). The threat condition and the efficacy dimensions combine effectively to provide an acceptable explanation for why threat appeals work.

The promotion of a maladaptive coping response needs to be minimised as it counteracts the behavioural intentions promoted in the health communications (Tanner, Hunt and Eppright 1991). Thus forming one of the main reasons for the failure of health marketing campaigns (Eppright *et al.* 2002), such as smokers that were exposed to graphic warnings that elicited higher levels of reactance disregarding the threat (Erceg-Hurn and Steed 2011). Although threatening stimuli are used to promote positive behaviours, on occasions preventative marketing has been regarded to have contradictory effects (Witte and Allen 2000; Myers and Frost 2002; Ringold

2002; Erceg-Hurn and Steed 2011). This shows that threatening messages in advertising do not always work as intended (Struckman-Johnson *et al.* 1990; LaTour, Nataraajan and Henthorne 1993; Keller and Block 1996; LaTour and Rotfeld 1997) which is called the boomerang effect (Wolburg 2006). The boomerang effect occurs when messages impact the observer with the incorrect results, such as increasing intentions to smoke rather than influence a reduction in behaviour (Rogers and Mewborn 1976; Kleinot and Rogers 1982; Maddux and Rogers 1983; Rippetoe and Rogers 1987; Witte 1992). Although much confusion surrounds the success of including threat appeals in advertising and health promotion (Ruiter, Abraham and Kok 2001; LaTour, Snipes and Bliss 1996), thorough research needs to be taken to overcome anti-smoking communications backfiring (Keller 1999; Grandpre *et al.* 2003). This is of particular emphasis with vulnerable adolescents, as threat appeals can often reinforce the negative behaviour (Hovland, Janis and Kelley 1953; LaTour and Zahra 1989). Wolburg (2006) ran a study which showed that college student smokers' used the anti-smoking messages as a prompt to smoke, showing the campaign backfired. Each campaign needs to be thoroughly researched to ensure no boomerang effects, as those with excessive, offensive or high fear appeals are often regarded as counterproductive and often causes a 'maladaptive coping response' where the observer disengages with the message (Hovland, Janis and Kelley 1953; LaTour and Zahra 1989; Hyman and Tansey 1990; Manyiwa and Brennan 2012).

It is hypothesised that smoking interventions can have contradictory effects, increasing smokers' optimism among pessimists (Myers and Frost 2002), showing that anti-smoking communications must be approached with caution. Especially as there are studies that show both a positive and negative correlation between perceived risk and protective behaviour in both cross sectional and longitudinal studies (Gerrard

et al. 1993). Although one explanation for this could be due to the difference health domains investigated (Rimal 2001). One major limitation is that the EPPM was only investigated with verbal messages (Wong and Cappella 2009). Considering current and former smokers' described that cigarette warning labels with text and graphics were substantially more of a deterrent than text-only labels (O'Hegarty *et al.* 2006) shows the need to investigate how text and image advertisements influence intentions. Especially as White, Webster and Wakefield (2008) suggested that graphic warning labels have the ability to lower smoking intentions.

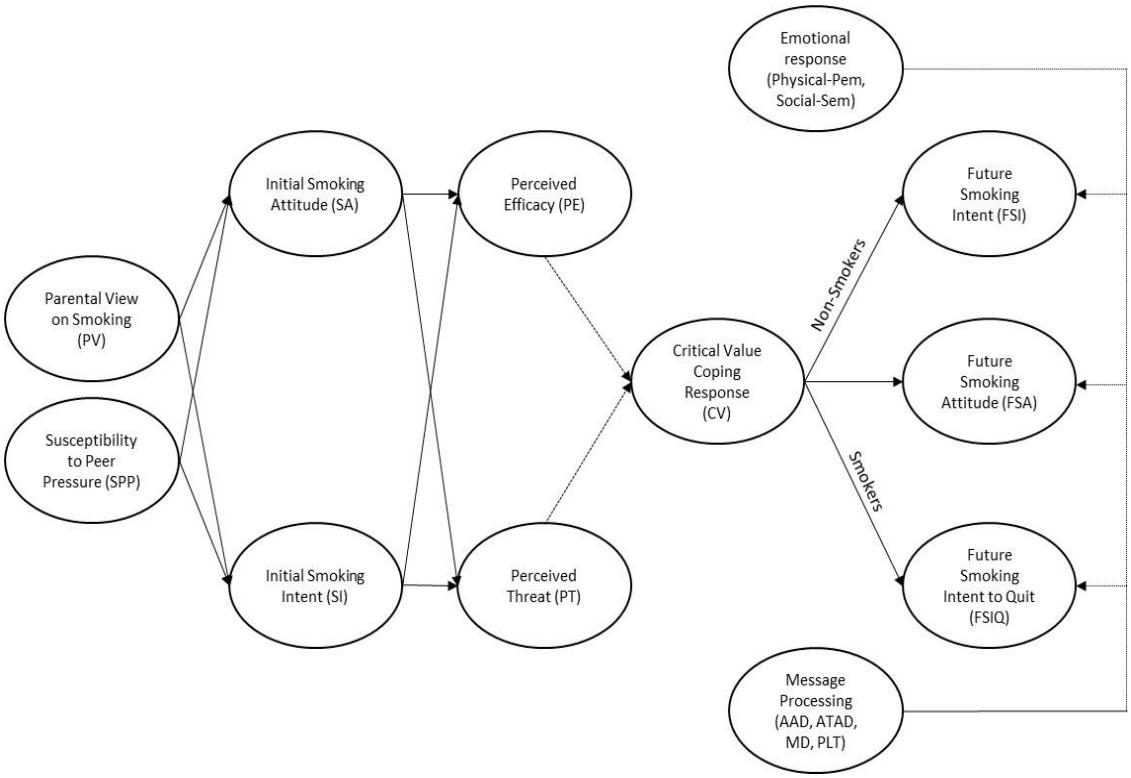
Considering the EPPMs validity has been questioned with a recent meta-analysis of threat appeals disconfirming a single model of investigation (Cameron *et al.* 2009) as the threat by efficacy interaction often failed to reach significance (Witte and Allen 2000; Floyd, Prentice-Dunn and Rogers 2000; Roskos-Ewoldsen, Yu and Rhodes 2004). It is necessary to evaluate the coping response critical point between perceived efficacy, perceived threat and the role of alternative emotional responses to threat appeals. The role of the coping response critical value point in behaviour models shows it is a central part of estimating behaviour using the established factors of perceived threat and perceived efficacy. The role of this value among adolescent non-smoker and smoker samples has not been explored. This raises the importance of investigating how the critical value influences post exposure responses to assess how the critical value can be modelled to estimate behavioural responses and investigate the fourth set of hypothesis contributing to the research proposition that:

> ***Proposition #4: 'The critical value will significantly influence post exposure behavioural responses to each threat condition'***

3.3 The conceptual model

It is vital to take into consideration the numerous models and theories that describe approaches to estimate behaviour and responses to gain a comprehensive understanding of health behaviour (Ickes and Sharma 2012). Considering the efficacy of predicting adolescents' responses is unknown, with no knowledge on the differences between adolescent smokers' and non-smokers' responses towards different threat appeals. Although different methods are used to prevent smoking initiation, there is still the need for more preventative measures to reduce the onset of adolescent smoking (de Vries *et al.* 2006). Research on smokers shows the importance of tailoring health education messages to the various stages within the theories of change model, highlighting the importance of segmenting based on smoking behaviour classification (De Vries and Mudde 1998). Considering behaviour models have not always been used to create prevention programs (Leventhal and Cleary 1980), the conceptual model emphasises how behaviour change occurs throughout different stages in a linear, sequential manner (West, 2005). The model is influenced by previous stage models (Leventhal, Glynn and Fleming 1987), which describe how decisions takes place over four stages of: 1) preparation, 2) initiation, 3) experimentation, and 4) maintenance. The initial stage being preparation and also called pre-contemplation explains when unaware of the behaviour change being proposed which is relevant to adolescents' who are in the initial pre-experimentation stage of smoking and unaware of the risks. The conceptual model is developed to estimate adolescents' responses through a selection of factors described in Figure 3.10.

Figure 3.10 the Conceptual Model



The paths are estimated to show relationships between factors. The model takes aspects from social learning theory in the initial stages, uses preliminary self-reported behaviour scales to establish how exposure influences post exposure responses. The model includes an adapted coping response critical value formed of the perceived threat and perceived efficacy constructs influenced by the health belief model and extended parallel processing model. The model is concluded with the post exposure self-reported behaviour items absent from previous models, the role of message processing and emotional response highlighted by the dear drive model and theory of reasoned action are included as antecedents of post exposure behaviour to assess how each threat influences responses. Table 3.2 describes the model factors and acronyms.

Table 3.2 List of conceptual model factor constructs and acronyms

Label	Construct Term	Label	Construct Term
PV	**P**arental **V**iew	**SPP**	**S**usceptibility to **P**eer **P**ressure
SI	**S**moking **I**ntent	**SA**	**S**moking **A**ttitude
PEm	**P**hysical **Em**otion response	**SEm**	**S**ocial **Em**otion response
PT	**P**erceived **T**hreat	**PE**	**P**erceived **E**fficacy
CV	**C**ritical **V**alue	**PLT**	**P**erceived **L**evel of **T**hreat
AAD	**A**ttitude towards the **Ad**vert	**ATAD**	**A**ttention **T**owards the **Ad**vert
MD	**M**essage **D**erogation	**FSA**	**F**uture **S**moking **A**ttitude
FSI	**F**uture **S**moking **I**ntent	**FSIQ**	**F**uture **S**moking **I**ntent
PTr	**P**hysical **Th**reat	**STr**	**S**ocial **Th**reat

3.4 Constructs

Risk factors and protective factors influence smoking initiation and need consideration. Risk factors frequently refer to family influence or social influence, whereas protective factors represent items related to protection from harm, such as perceived threat and perceived-efficacy (Chang *et al.* 2006). The health models and threat models use constructs including severity and susceptibility (Prentice-Dunn and Rogers 1986) with strong support and evidence to estimate the associations between intentions and efficacy dimensions (Ruiter, Abraham and Kok 2001). There is weak support for the relationship with perceived threat dimensions showing the need for research (Bandura 1997; Floyd, Prentice-Dunn and Rogers 2000; Milne, Sheeran and Orbell 2000). Considering the three cognitive variables: beliefs, attitudes, and intentions are perceivably interconnected (Lutz 1977), with a stimulus initially influencing beliefs, then attitude and subsequent behavioural intentions (Mitchell and

Olson 1981). The role of attitude influencing behaviour is investigated to provide results showing how attitude influences prospective behaviour alongside intentions.

Intentions

The prominence of monitoring intentions is supported by various behavioural models that suggest intentions act as an important, influential and immediate antecedent of behaviour (Madden, Ellen and Ajzen 1992; Malhotra and McCort 2001; Ajzen 2002; Sheeran 2002; Allom *et al.* 2013) and represents the motivation to carry out a specific behaviour (Ajzen 1991; Eagly and Chaiken 1993). Although research has suggested inconsistencies between forming an intention and performing behaviour (McEachan, Conner, Taylor and Lawton, 2011) intentions are central to numerous behaviour change theories being vital to influence moderate intentions to participate in prevention behaviours (Ickes and Sharma (2012). Intentions have been researched across an array of public health contexts and have shown to influence behaviours from smoking, sunscreen use to blood donation being a consistent predictor of behavioural outcomes (Ferguson and Bibby 2002; Ferguson *et al.* 2007; Godin *et al.* 2007; Masser *et al.* 20089; Van Dongen *et al.* 20014) and on occasions accounted for 56% of the variance in behaviour outcomes (Allom *et al.* 2012). There are numerous meta-analyses which show that intentions are reliably associated with behaviour showing similar effects (Sheeran, Abraham and Orbell 1999; Webb and Sheeran 2006). Sheeran's (2002) meta-analysis of 10 meta-analyses compiling 422 studies concluded that intentions attributed to 28% of variance in behaviour (r=0.53) with Webb and Sheeran's (2006) meta-analysis identifying 47 experimental tests of intention-behaviour relationship which showed a medium to large change in intention (r=0.66) lead to a small to medium change in behaviour (r=0.36). Table 3.5 shows a

selection of the studies included in the meta-analysis that use the theoretical models that influence the conceptual model.

Table 3.5 Meta-analysis results on relationship between Intent and Behaviour

Theory	Correlation	Study
Theory of Planned Behaviour	Intent and behaviour (r= 0.47)	Armitage and Conner (2001), Trafimow, Sheeran, Conner and Finlay (2009)
Protection Motivation Theory	Protection motivation (Intent) and behaviour (r=0.40)	Milne, Sheeran and Orbell (2000), Floyd, Prentice-Dunn and Rogers (2000)
Theory of Reasoned Action	Intent and behaviour (r=0.47)	Hausenblas, Caron and Mack (1997), Hagger, Chatzisarantis and Biddle (2002)

It is important to assess people's involvement level and facets that can influence how they react to and process information (Greenwald and Leavitt 1984; Kardes 1988). Intentions are expected to better predict behaviour when participants have minimal experience of the behaviour (Ouellette and Wood 1998), although the impact of past behaviour is diminished when intentions are strong and well-formed (Ajzen 2002). With one of the most important influences to predict smoking uptake is intentions and perceptions of smoking (Pierce *et al.* 1996). Bruvold's (1993) meta-analysis of 94 separate intervention programs highlighted that intentions to smoke are influenced by; personal attitude towards smoking, social norms regarding smoking and perceived behavioural control over smoking. In order for interventions to be effective they must assess behavioural norms and beliefs held by the target group. Reinforcing the need to

understand what influences adolescents' to smoke (Amos *et al.* 1997), as 'older teenagers have stronger intentions to smoke than their younger peers, emphasizing the importance of contact in the pre-teen transitional stages' (Tangari *et al.* 2007; p. 71). Although self-reports are able to predict behaviour, there are other factors that affect the strength of the intentions-behaviour link (Morwitz, Johnson and Schmittlein 1993) with findings providing evidence about how adolescents' intentions are influenced by an array of factors. Research has consequently attempted to disentangle the relationship between intention and behaviour by testing additional post-intentional variables (Allom *et al.* 2012) such as attitude and subjective norms that have been shown to influence intentions and behaviours (Ickes and Sharma 2012). Obtaining respondents views on attitude and intentions towards behaviour has been shown to change subsequent behaviour (Hirt and Sherman 1985), by the processing enabling the responses to become more accessible (Kardes, Allen and Pontes 1993; Morwitz, Johnson and Schmittlein 1993) which supported research adopting the attitude-behaviour framework (Godin and Shephard 1990).

Attitudes

The discipline of social psychology stressed the importance of attitude-behaviour consistency (Cooper and Croyle 1984) describing that an attitude represents a function of belief at any given point in time (Fishbein and Ajzen 1975). A commonly accepted definition states that attitude is not overt behaviour but a disposition which influences behaviour (Hassanein and Head 2007), with Conner *et al.* (2002) raising the importance of understanding the relationship between attitudes and behaviour as an additional mediator of behavioural outcomes. Monitoring attitudes as antecedents is provided throughout the literature that describe attitude can directly influence

behaviour. Substantial evidence states that attitude at times is a better predictor of behaviour than intent (Albrecht and Carpenter 1976; Bentler and Speckhart, 1979; Manstead, Profit and Smart 1983) significantly influencing behaviour when controlling for intent (Bentler and Speckhart 1981) showing that intentions may not completely mediate the effects of attitudes on behaviour (Bagozzi, Yi and Baumgartner 1990). Affect, cognition and attitude are undisputed areas in the field of advertising with interest in attitude research spanning throughout the domains of marketing and psychology (Homer 2006). The process of attitude-change concerns an evaluative state conceptualised by an emotional or cognitive response that influences affect and potentially behaviour (Labroo and Ramanathan 2007). The attitude towards a specific behaviour being a result of the consequences expected from performing the behaviour (Brug, Lechner and De Vries 1995). Although the relationship between attitudes and behaviours is heavily debated (Beltramini 1988) and there are inconsistencies regarding a universal description of attitudes (Muehling and McCann 1993), it is important to assess how attitudes estimate and contribute to adolescents' behaviour. Especially as Elliot *et al.* (2015) stated attitude is a bi-dimensional predictor of intentions and behaviour towards health risks, rather than a unidimensional predictor of intent preceding behaviour. This shows the importance of monitoring how attitudes estimate intent and behaviour as once attitudes and intentions are established they subconsciously guide behaviour with stronger attitudes known to influence intentions (Armitage and Conner 2001); further research will uncover how attitude estimates adolescents' behavioural responses to threat appeals.

Marketing and social psychologist researchers monitor attitude to gauge responses and beliefs to an advertisement, brand or situation (Mitchell and Olson 1981). The common theories suggest that attention allocation to a stimulus is partially dependent

on stimulus relevance (Bundensen *et al.* 2005; Cisler, Olatunji and Lohr 2009). Although prior experience influences stronger attitudes towards the behaviour rather than the advertisement (Andrews *et al.* 2002), the basic assumption suggests that if a strong positive attitude is created towards a threat appeal, the observer would have greater involvement and possess a more negative view towards the content. This promotes avoidance and reduces the intention, conceptualised as an adaptive coping response. Attitudes have been shown to influence behaviour change from health concerns to environmental issues (Brug, Lechner and De Vries 1995; Manaktola and Jauhari 2007). The research will provide findings about how attitude is influenced by social factors and influence prospective smoking behaviour in comparison to intentions.

Social learning factors

Considering a major influence upon adolescent smoking initiation is learned through modelling and social reinforcement (Thirlaway and Upton 2009), the involvement-attitude-intention relationship and social learning describes how previous behaviours and social environment influence attitudes and intentions (Griffin and O'Cass 2004). This highlights the need for prevention programmes to address predictor factors. In order to understand responses to anti-smoking threat appeals, the social facets which influence adolescents' behaviours need consideration (Crawford, Baich and Mermeistein 2002). Especially due to the difficulties when creating a campaign to prevent smoking initiation; not only is basic smoking history required, but all the potential influential factors need evaluating (MacKinnon *et al.* 1991; Chang *et al.* 2006).

Although there are various facets that influence adolescents to smoke, perceived personal relevance may be critical to the emotional and cognitive impact of threat information (Ruiter, Abraham and Kok 2001) as prior experiences influence decision making even when risks are high (Kusev *et al.* 2009). A meta-analysis of three prevention studies concluded that norms about smoking prevalence, social acceptability, and social pressures are important mediators for behavioural intentions (Botvin *et al.* 1992). Especially as a community based prevention project concluded that peer influence on smoking mediated a 45% effect on cigarette use among adolescents aged 12-14 (MacKinnon *et al.* 1991). In order to establish the most influential facets Conrad and colleagues (1992) reviewed 27 studies investigating the onset of smoking resulting in nearly 300 behavioural predictors for smoking experimentation. The conclusions provided 6 factors categorising that influence adolescent smoking initiation including peer pressure and parent views influence smoking attitude, intent and behaviours which is shown in Table 3.3.

Table 3.3 Peer pressure and parent influence on adolescent behaviours

Studies	**Findings**
Smith and Stutts (1999); De Lorme, Kreshel and Reid (2003); Smith and Stutts (2006).	Peer pressure and parental smoking influence smoking initiation
Krohn *et al.* (1983); Chassin *et al.* (1990); Botvin *et al.* (1992); Escobedo and Marcus (1993); Fergusson, Lynskey and Horwood (1995)	Peer pressure and parent influence heightens during adolescence
Charlton and Blair (1989); Aitken and Eadie (1990); Hastings and Aitken (1995); Epstein, Botvin and Diaz (1999); Leatherdale *et al.* (2005)	Adolescents' more likely to experiment if peers and parents express behaviour.
Conrad, Flay and Hill (1992; Hu *et al.* (1995); Alexander *et al.*(2001) Simons-Morton (2004)	Susceptibility to peer pressure influence behaviour

It is regarded that adolescents' inherit their culture from their peers, family network and school environments through group socialisation (Carlson and Grossbart 1988; Harris 1995; Ruiter, Abraham and Kok 2001), these factors form an adolescents' key 'reference group' being an important determinant of adolescents' behaviour (White 1987).

a) Susceptibility to Peer influence

During early adolescence susceptibility to peer influence is at its highest (Steinberg and Scott 2003) outweighing parental and family influences (Ransom 1992; Chang *et al.* 2006). Adolescents' often mimic their peers' behaviour to conform to social norms (Messer *et al.* 2011) and spend more time with peers (Larson *et al.* 1996), explaining why peer networks have the greatest influence on adolescent smoking acceptance and initiation rates (Conrad, Flay and Hill 1992; Chassin *et al.* 1990; Alexander *et al.* 2001). Friends are regarded as the most powerful predictor of smoking (Urberg, Cheng and Shyu 1991; Fergusson, Lynskey and Horwood 1995; Alexander *et al.* 2001). Although adolescents' frequently overestimate peer smoking frequency and prevalence (Sherman 1983; Sussman *et al.* 1988; Chassin *et al.* 1991; Urberg, Cheng and Shyu 1991), it is paramount to target adolescents entering secondary school as susceptibility to peer influence peaks in early adolescence (Steinberg and Scott 2003) reported to be as young as 9 years old (Botvin *et al.* 1994). Peer association estimated to account for 80% of variance in smoking behaviour among 16 year olds (Fergusson, Lynskey and Horwood 1995) showing the necessity of understanding how susceptibility to peer pressure influences 11-13 year olds smoking attitude and smoking intentions prior to exposure to a threat appeal.

b) Parental smoking view

Parental modelling is a major influence on intentions to smoke (Tyas and Pederson 1998; Hoving, Reubsaet and de Vries 2007). Adolescents' are more likely to imitate parents who smoke (Emery *et al.* 2000; Bricker *et al.* 2007), as 'early exposure to parental smoking may significantly influence children to smoke when they get older' (Otten *et al.* 2007; p.145). Research suggests that there is a strong relationship between parents' attitudes towards risky behaviours and adolescents' actual behaviour (Oman *et al.* 2004), with parental smoking being a major influential factor in the transition between experimental smoking and regular use (Flay, Hu and Richardson 1998).

The social factors (parental smoking view and susceptibility to peer pressure) are included to uncover how smoking attitude and intentions are influenced and can be integrated into the conceptual model estimating how adolescents' respond to threat appeals leading to the hypothesis affiliated with the fifth proposition:

> ***Proposition #5: 'Social factors will significantly influence smoking beliefs and attitudes'***

Coping response

The coping response represents the cognitive and behavioural efforts to manage internal and external demands (Folkman *et al.* 1986); it is a highly personal, dynamic appraisal that influences acceptance or denial of the threatening stimuli or situation (Folkman and Moskowitz 2004). The ability to carry out a coping response is one of the most important dimensions influencing a response to a threatening event (Snipes,

LaTour and Bliss 1999), with the purpose of a coping response being to 'remove the threat and/or lessen the fear that may be associated with the threat' (Tanner *et al.* 1991; p. 39). There is a scarcity of research in coping responses in consumer research towards health and behaviour change (Duhachek 2005) with significantly less research on adolescents than adults (Compas *et al.* 2001). Considering risky coping decisions occur throughout the entire adolescent population as a 'universal' way of coping (Piko 2001), it possesses a large effect on adolescents' health and lifestyle choices (Frydenberg and Lewis 1996).

Ultimately the success of a threat appeal is determined by how the viewer copes with the threat communicated influenced by the level of resistance (Dickinson-Delaporte and Holmes 2011), as behaviours either strive to cope, or reduce the negative emotion elicited (Luce and Irwin 1997). Friestad and Wright (1994) described that experiencing emotions to advertisements increases coping responses as 'appraisals are characterized by intense negative emotions, suggesting that coping responses are initiated in an emotional environment' (Folkman and Moskowitz 2004; p. 747). The dichotomous classification of coping responses has labelled pairs namely approach vs. avoidance, support seeking vs. dependent and adaptive vs. maladaptive, active vs. passive coping, and engagement vs. disengagement (Compas *et al.* 2001; Piko 2001). The different types of coping originate from problem focused coping responses which activate methods to solve and overcome the negative emotional stimuli, and emotion focused coping promotes avoidance and denial (Folkman *et al.* 1986). Problems occur when emotion focused coping prevails and the message is rejected which leads to avoidant coping behaviours (Luce, Payne and Bettman 1999; Duhachek 2005). Table 3.4 provides a number of studies that illustrate how the perception of a threat influences the different types of coping responses.

Table 3.4 Previous studies illustrating the difference between coping responses.

Studies	Findings
Leventhal (1970); Rogers (1975); Sutton (1982); Rippetoe and Rogers (1987); Tanner *et al.* (1991); Piko (2001); Dickinson-Delaporte and Holmes (2011).	Adaptive coping response caused by the perception of a threat strengthens intentions to overcome the threat and accept the behaviour.
Luce, Payne and Bettman (1999); Piko (2001); Eppright *et al.* (2002); Duhachek (2005); Harris *et al.* (2007); Leshner and Cheng (2009); Erceg-Hurn and Steed (2011).	Maladaptive coping response caused by the increased physical emotional response influences risky behaviours like continued smoking.

An adaptive coping response actively promotes behavioural change by influencing the observer to overcome the threat which concerns the 'danger control' aspect, whereas a maladaptive coping response does not overcome the threat but reduces the perceived level of threat without reducing the danger overcoming the 'fear control' dimension (Tanner, Hunt and Eppright 1991). The promotion of a maladaptive coping response is dangerous as the threat is reduced, but the danger is not avoided (Arthur and Quester 2004; Duhachek 2005). The only way to understand the different coping responses is to investigate them in the specific context that they will occur (Folkman and Moskowitz 2004). The perceived probability of harm influences the formation of the coping response as perceived efficacy and perceived threat are regarded reliable predictors of preventive health behaviour (Janz and Becker 1984; Rimal 2001). The importance of investigating the concepts is made throughout the literature that self-efficacy, among other risk factors should be addressed in further studies on adolescent smoking onset (Sussman *et al.* 1987; Ruiter and Kok 2005).

a) Perceived efficacy

Self-efficacy is an important factor in successful behaviour change (Dzewaltowski, Noble and Shaw 1990; Thompson, Barnett and Pearce 2009) and can influence motivation, intentions and behaviour (de Vries, Dijkstra and Kuhlman 1988; Dzewaltowski, Noble and Shaw 1990; Terry and O'Leary 1995; Bandura and Locke 2003). A cohesion between the behaviour and ability is essential to form an efficacious response (Leventhal 1970) warranting a significant role in health promotion (Heale and Griffin 2009). There are numerous definitions of self-efficacy describing an expectation and ability to perform a specific behaviour (Bandura 1997; DiClemente 1986; Godin *et al.* 1992; Choi *et al.* 2001). It is a protective factor in explanatory models of behavioural change originating from social learning theory (Bandura 1999; Simons-Morton 2004) and in numerous addictive behaviour models (DiClemente 1986; Baer, Holt and Lichtenstein 1986; Ockene *et al.* 2000; Van Zundert *et al.* 2010). Investigating self-efficacy with the adolescent population will promote a greater understanding of how to influence smoking cessation and prevention (Panday 2005). Although the traditional measure of self-efficacy needs evaluating to reflect the needs of adolescents (Panday 2005; Heale and Griffin 2009). There is a paucity of research into the role of self-efficacy and anti-smoking advertising, with two meta-analyses that reviewed over 50 empirical studies of anti-smoking advertising not finding the self-efficacy concept (Flay 1987; Wakefield *et al.* 2003). Self-efficacy is domain and context specific (Manyiwa and Brennan 2012) with the link between self-efficacy and abstention not being well documented (Gwaltney *et al.* 2009). This is relevant for ‘non-smoking adolescents who have higher self-efficacy expectations towards non-smoking than smokers’ (DeVires *et al.* 1988; p 273).

One explanation is that there are different conceptualisations of perceived self-efficacy (Bandura 1997). Self-efficacy in the anti-smoking domain concerns the ability to stop smoking or the ability to not start smoking (Arthur and Quester 2004). This is 'abstinence self-efficacy' which focuses on the confidence to abstain from engaging in certain addictive behaviours (DiClemente, Prochaska and Gibertini 1985). Perceived efficacy is an influential factor on perception and attitudes to a threat appeal (Tanner, Hunt and Eppright 1991; LaTour and Rotfeld 1997; Snipes, LaTour and Bliss 1999; Arthur and Quester 2004), as greater efficacy is associated with greater involvement to threat appeals (Manyiwa and Brennan 2012). The relationship between self-efficacy and smoking behaviour is established, as those with higher self-efficacy were able to refrain from smoking more than those with low self-efficacy (de Vries, Dijkstra and Kuhlman 1988; Ruiter and Kok 2005). Ruiter *et al.* (2005) concluded that those with low self-efficacy at ages 12 and 13 years had enhanced levels of intentions to smoke, or already smoked. This shows the need to assess how self-efficacy influences the adolescent population (Thompson, Barnett and Pearce 2009) particularly as self-efficacy reduces as adolescents' progress through school (Chang *et al.* 2006).

b) Perceived threat

The perceived probability that harm will occur is seen to regulate behaviour and intentions (Weinstein 2000), known as the perception of a threat (Floyd, Prentice-Dunn and Rogers 2000). The greater perception of threat has been shown to strengthen intentions to promote an adaptive coping response (Leventhal 1970;

Rogers 1975; Sutton 1982; Rippetoe and Rogers 1987). It is an integral part of persuasive advertising and central to behaviour change models (Witte 1994), being the culmination of perceived susceptibility and perceived severity of reactions to a threat (Prentice-Dunn and Rogers 1986). Although severity and susceptibility interactions have been conceptualised in theories there is a lack of applications in health contexts (Weinstein 2000) or with adolescents regarding anti-smoking threat appeals.

Perceived vulnerability to a threat increases the desire to take protective action (Floyd, Prentice-Dunn and Rogers 2000) which is able to mediate intentions from witnessing a threat appeal. This represents perceived susceptibility which is the belief about one's risk of experiencing the threat (Witte *et al.* 1996). This represents the subjective perception of risk, probability of occurrence, and vulnerability to a health threat (Prentice-Dunn and Rogers 1986; Arthur and Quester 2004). This is expressed in smokers that are aware of the health risks, yet have low perceived susceptibility of the threat (Waltenbaugh and Zagummy 2004). This optimistic bias among smokers results in lower perceptions of personal harm from smoking (Waltenbaugh and Zagummy 2004) which is prevalent in adolescents showing the need to convey that adolescents' are highly susceptible and vulnerable to smoking health risks (Pechmann *et al.* 2003).

The severity of a threat has been debated throughout the literature (Arthur and Quester 2004), being classified as a facet that influences threat appraisal (Rogers 1983). The perceived severity inevitably influences the extent of contemplation of behaviour depending on the level of concern from the threat (Prentice-Dunn and Rogers 1986). It is a cognitive mediating process (Tanner, Hunt and Eppright 1991) that enables protective action to be taken when awareness of the harm from the threat

is acknowledged (Floyd, Prentice-Dunn and Rogers 2000). This harm was described as 'beliefs about the significance or magnitude of the threat' (Witte *et al.* 1996; p.320). Severity manipulations in threat appeals were shown to produce the strongest effects on perceptions. Fear, susceptibility and perceived-efficacy manipulations all produced moderate effects with the stronger severity manipulations being accounted for by vivid and gruesome pictures (Witte and Allen 2000). Although expressing severity does not always work for health prevention campaigns (Pechmann *et al.* 2003), severity of a threat is shown to influence intentions, especially when a negative emotion is present (Arthur and Quester 2004) showing need for more research to assess how the boomerang effect influence adolescents' attitude and intent responses.

Message Processing

Advert message processing provides the basis to identify how a stimulus, processing and response variables influence cognitive (thoughts about the context or advert) or affective (attitude towards the advert) responses that influence attitudes and intentions (MacInnis and Jawroski 1989). Although the message processing concepts have been widely used, more research is needed to understand the effects upon other behavioural intentions, attitudes and behavioural responses (Muehling and McCann 1993) than commercial attitudes and intentions (Mitchell and Olson 1981; Shimp 1981; Gelb and Pickett 1983). Considering attitude and behavioural change are influenced heavily by message elaboration (Petty and Cacioppo 1981), cognitive elaboration is a prerequisite for attitude change (Borland 1997) captured partially through message processing and emotional responses. The processing of an advertisement consists of a comprehension and elaboration factor, initially decoding the stimuli, followed by the

elaborating based on views, beliefs and counter arguments (Gardner *et al.* 1985) made of attitudes, attention, derogation and emotional response towards a stimulus.

a) Attitude towards the advert

There are several psychological models that theorize the way visual elements in an advertisement effect a consumer response (Scott 1994). Considerable amount of research into attitude towards the advert (Muehling and McCann 1993) has been catalysed by the relevance of the construct to marketing and attitudinal theory models. The attitude towards the advert (AAD) construct is designed to evaluate attitudes and beliefs towards the central theme and appeal of the advertisement (Mitchell and Olson 1981; Shimp 1981). Frequently defined as the 'viewer's general liking or disliking of an advertisement' (Phelps and Thorson 1991; p. 202), AAD is the consequence of an affective reaction to an advertisement (Batra and Ray 1986). A better understanding of the link between AAD and behavioural intentions is needed as the use of AAD for public health advertisements is under researched with limited attention on the development of specific adolescent scales (Phelps and Hoy 1996). Previous studies consistently find a relationship between emotional response items and AAD (Edell and Burke 1987; Holbrook and Batra 1987; Madden, Allen and Twible 1988; Cho and Stout 1993) having a direct positive influence on behavioural intention (Manyiwa and Brennan 2012).

b) Attention towards the advert

Attention towards the advert (ATAD) represents a facet in need of consideration, especially as higher attention to a stimuli leads to better memory performance (Mick 1992). As attention increases, greater amounts of working memory is allocated to the

stimulus (Smith and Yang 2004), increasing cognitive and affective reactions. Attention is essentially a multi-layered neural networks which continuously feedbacks to influences judgement (Heinke and Humphreys 2003). It acts as a mechanism which selects information for additional processing and reflects the level of focus given to the advert that can be viewed from low to high (Greenwald and Leavitt 1984; Helgeson 1985). During the pre-attentive stage adverts can use numerous facets including bright colours or affect-evoking stimuli to get noticed (Greenwald and Leavitt 1984; Smith and Yang 2004), although difficulties occur with low-involvement items as advertising messages are processed without paying conscious attention to the advert (Heath 2001) which could result in smokers' ignoring the advert due to low relevance or optimistic bias.

c) Message Derogation

Message derogation also known as depth of processing is the strength or memorability of a message (Craik 1972; Helgeson 1985), which processes information dependent on levels of memory directs attention to new information (Anderson 1990). This ultimately reflects 'the level of understanding regarding the adverts information and can be obtained via simple message recognition to constructive processes such as relating the message to one's personal life, role taking or imagining the product in use' (Smith and Yang 2004; p.40). The items have been used in various contexts including health research assessing adult and adolescent smokers' processing of cigarette warning labels (Moodie, MacKintosh and Hammond 2010; Hammond *et al.* 2004). The adolescent smokers' had low levels of processing towards text only warnings, rarely discussing the content due to their low involvement and 'shallower processing involving encoding the surface features of the stimuli' (Nordhielm 2002;

p.373). Participant involvement, motivation, ability and opportunity to process information need to be considered (Campbell and Kirmani 2000). At the same time participant involvement can lead to greater message derogation and processing (Cacioppo *et al.* 1986) as non-smokers will be more involved with the social threats being the outsiders.

3.5 Emotional responses within threat appeals

There is an increased importance to investigate how different facets of marketing can affect persuasiveness (Kidwell *et al.* 2011), especially how emotions play a direct role in the effectiveness of marketing communications (Zeitlin and Westwood 1986). Current research does not distinguish between emotional (arousal) and cognitive (threat perception) responses to threat appeals. Ruiter *et al.* (2001) questioned the scientific rigour and evidence based approach to promoting emotions to health related threat appeals showing how research into how negative emotions influence response threat appeals is of high relevance to health practitioners and marketing professionals.

Although the majority of research into counter-marketing communications has focused on the relationship between fear arousing communications and the subsequent behaviour and attitude change. The research has resulted in equivocal evidence (Ghingold 1981), highlighting the gap for threat appeal and emotion response research to health promotion which has primarily focused on a fearful emotional response (Keller and Block 1996). Considering emotions are perceived to affect information processing by two distinct paths (Thorson and Friestad 1985), firstly leading to experiencing certain emotions (Aaker and Williams 1998), which subsequently influences judgment and secondly, influencing judgment when the onset of the

emotion is incidental to the message (Lerner and Keltner 2000). The promotion of various emotions presents an opportunity to assess how different negative emotions influence persuasiveness (Raghunathan and Pham 1999; Grasshoff and Williams 2005), as 'Scant attention has been paid to the types of emotions that influence the effectiveness of health messages' (Agrawal *et al.* 2007; p. 101). Although research has investigated the role of emotions in attention-perception (Niedenthal and Kitayama 1994) and attitudes-persuasion (Cacioppo *et al.* 1992), there is still a lack of research examining the effects of emotions and the message persuasiveness (Maheswaran and Chen 2006). Specifically there is a limited amount of research into the persuasive effects of negative affective appeals (LaBarge and Godek 2005). The role of the negative emotions influences the decision making process and actions need to be further researched (Bechara, Damasio and Damasio 2000) investigating how emotions influence the effectiveness of health communications (Salovey *et al.* 2000) and influence attitude towards an advertisement and behavioural intentions (Moore and Hoenig 1989).

The link between the emotional response and persuasion is regarded to be positive and linear (Boster and Mongeau 1984; Sutton and Eiser 1984; Rotfeld 1988). As a persuasive message being found to be more likely to lead to attitude change if the observer is emotionally aroused (Arnold 1985) which is central to threat appeals persuasive strategy (LaTour and Rotfeld 1997; Witte 1992). Therefore it is important to investigate how emotions can influence persuasive marketing communications (Bagozzi, Gopinath and Nyer 1999; Kidwell *et al.* 2011) and promote behavioural change.

Emotions and behavioural change

Emotions play an essential role in daily life, directing attention and motivating behaviour to deal with opportunities and threats (Tangney 1996; McMurran 2011) through either engaging or disengaging with the subject (Frijda, Kuipers and ter Schure 1989). The role that emotions have upon behaviours has been proposed by many academics (Lerner and Keltner 2001), collectively suggesting that the functional role of emotions is to promote an adaptive response that regulates behaviour to overcome a situation through states of action readiness motivating goal-driven behaviour (Frijda 1986; Frijda 1987; Campos, Campos and Barrett 1989; Frijda, Kuipers and ter Schure 1989; Ekman 1992; Izard *et al.* 1998; Rottenberg, Ray and Gross 2007). There has been a rise in research that focuses on emotion and coping responses to grasp a better understanding of how emotions influences responses to marketing (Holbrook and Hirschmann 1982; Luce and Irwin 1997; Groppel-Klein 2014; Gross 2015). Emotions have multiple functions, directing action (Parkinson 1996; Haidt and Keltner 1999), and affecting cognitive mechanisms including decision making, attention and judgment (Clore *et al.* 1993). The importance of investigating emotional responses was provided by Johnson-Laird and Oatley (1992) who stated that emotions direct attention to the emotion eliciting event or stimuli, and can motivate and persuade as well as influence attitude and behaviour (Bagozzi, Gopinath and Nyer 1999) promoting self-linkage to the advertisement (Maclnnis and Stayman 1993).

Multiple Emotional responses

Emotional responses have been investigated across various domains by a wide range of scientific disciplines, with diverse theoretical perspectives ranging from social and clinical psychology to consumer behaviour (Holbrook and Batra 1988; Kovecses 1990; Richins 1997; Olatunji and Sawchuk 2005; Gropell-Klein 2014). Recent theoretical models have suggested that emotions play an important role in decision making (Harlé and Sanfey 2007), with a rise in research focusing on how emotions influence coping in different aspects of consumer behaviour (Holbrook and Hirschman 1982; Luce and Irwin 1997), between different emotions (Yi and Baumgartner 2004) and influence advertising effectiveness (Poels and Dewitte 2008; Gropell-Klein 2014).

Although previous studies have shown that the differing levels of threat appeals have no major significant influence on emotional response and the respective coping responses (Tanner, Hunt and Eppright 1991; Dickinson and Holmes 2008). Some studies have shown the importance of investigating alternative negative emotional results such as Dickinson and Holmes (2008) who concluded that although not significant, disgust had the highest correlation with coping response than all other negative emotions, including fear investigated towards a threat appeal. This highlights that other negative emotions should be acknowledged when estimating behaviour change from witnessing a threat appeal. Considering appraisal theories propose each emotion is associated with a specific way of appraising the environment (Tong 2010). Particular emotions are linked certain behavioural characteristics (Frijda 1986; Lazarus 1991; Roseman, Wiest and Swartz 1994). This shows the need to investigate different negative emotions, as research would enable insight into what appraisals

constitute particular emotional experiences which has implications for public service announcement and behaviour change campaign design (Kumar and Oliver 1997).

Acknowledging behaviour in the real world presents difficulties for emotional researchers investigating singular emotions, as it is very rare to experience one emotion at a time, but in fact common to experience a mixture of emotions (Zelenski and Larsen 2000; Grasshoff and Williams 2005; Groppel-Klein 2014). Considering emotions are perceived to overlap (Lascu 1991), the emotional ambivalence promoted from one stimulus needs consideration (Otnes, Lowrey and Shrum 1997) which is prevalent throughout marketing where mixed emotional responses are perceived to influence advertisement persuasiveness (Aaker and Williams 1998). This is an area that needs further research attention from advertising research (Groppel-Klein 2014). Although the literature on mixed emotions is a relatively under researched topic, advertisements evoking multiple emotions are not uncommon in marketing, with research on mixed emotions slowly growing in interest (Priester and Petty 1996; Larsen, McGraw and Cacioppo 2001). Previous research, particularly in threat appeals has predominantly focused on investigating one type of emotion, namely fear (Keller and Block 1996); enhancing the need to sample a range of negative emotions simultaneously (Donovan and Henley 1997). It is important to establish how one emotion interacts with another, as one emotion may activate, amplify or attenuate another (Izard 1977) or have contradictory effects highlighting the need for research to include mixed emotions from the same valence such as anger and fear (Grasshoff and Williams 2005).

Numerous marketing studies propose that an advertisement that induces a negative emotion has the ability to influence attitude and behaviour (Ghingold 1981) and overcome the stimuli or reduce the negative emotion elicited with the behaviour (Luce

and Irwin 1997). One reason for this is that negative emotions correspond with the avoidance system in memory, although from the same valence, 'not all the negative emotions promote the same motivational or behavioural outcomes' (Grasshoff and Williams 2005; p. 78). Various academics have proposed that sadness, and fear should be regarded as event-directed emotions, whereas shame and guilt are self-directed emotions. Disgust falls into both categories showing each emotion may be elicited to different circumstances (Roseman, Spindel and Jose 1990). Although the links with other emotions has promoted an increase in attention to moral emotions that are regarded 'the neglected siblings of the basic emotions' (Tangney 2005; p.541). The 'self-conscious' emotions of shame, embarrassment and guilt are seen to be paramount to social acceptance and behavioural change (Tangney, Stuewig and Mashek 2007) often being expressed regarding the disapproval for the behaviours of others (Gutierrez and Giner-Sorolla 2007). These emotions are able to influence moral judgements and decision making (Greene *et al.* 2001; Hutcherson and Gross 2011) and provide a motivational factor able to influence behaviour for the better of society potentially motivating ethical behaviour (Cohen *et al.* 2011). Previous research proposes that moral emotions have the ability to promote social behaviour (de Hooge *et al.* 2011) lending them perfectly to social marketing theory. Although the literature on the direct link between emotion and behaviour change has resulted in minimal evidence of a direct causation (Baumeister *et al.* 2007; Baumeister and Lobbestael 2011), the effects of emotions are perceived to be mainly a cognitive processes rather than directly a behavioural influence (Schwarz and Clore 2007).

a) Physical emotional responses

Physical emotional responses are traditionally elicited from threat appeals with various emotions overlapping from the primary emotion cluster (Damasio 2002). Evaluations of fear, disgust, sadness and anger from the eight basic and primary emotions (Hupp *et al.* 2008; Groppel-Klein 2014) are perceived to overlap. Being highly arousing, avoidance-related negative emotions (Lang, Bradley and Cuthbert 1990; Woody and Teachman 2000; Leshner *et al.* 2010) and that are characterised by specific behavioural reactions Groppel-Klein 2014). The emotion often co-vary as research has shown adolescents' felt strong feelings of sadness and fear towards anti-smoking advertisements (Biener *et al.* 2004), while anger and disgust share a socio-emotional core (Marzillier and Davey 2004; Duhachek 2005) with the terms often used interchangeably with disgust being used as a synonym for anger (Russell and Fehr 1994). The highly correlated emotions (Simpson *et al.* 2006) form a physical emotional response cluster for adolescents' responses to understand how the emotions influence responses. Although the emotions are classified as one cluster, each emotion has independent action tendencies.

Fear is described as a negative valence emotion that coincides with high levels of arousal (Witte 1992), ultimately focused on escaping or avoiding an external danger (Toronchuk 2007) 'triggered by the perception of threatening stimuli' (Lennon and Rentfro 2010; p. 59). The response involves physiological arousal that motivates cognitive, affective, and behavioural responses that are directed towards the reduction or elimination of the fearful image, situation or stimuli (Dijker, Koomen and Kok 1997). Fear arousal from threat appeals is perceived to have a persuasive strategy (LaTour and Rotfeld 1997; Witte 1992), with many studies describe that fear arousal

enhances persuasion (Higbee 1969; LaTour and Pitts 1989; Rotfeld 1988; King and Reid 1989). Although the effects on behaviour are not well established as some research shows that fear influences attitude change but not behaviour (Dembroski, Lasater and Ramirez 1978; Schwarz, Servay and Kumpf 1985; King and Reid 1989) with inconsistencies in research interpretations as some that experience fear tend to shy away from risk (Lerner and Keltner 2001).

Not typically considered in the moral domain, anger is a negatively valence, other-focused, approach-related, anticipatory emotion (Loewenstein *et al.* 2001; Tangney, Stuewig and Mashek 2007; McMurran 2011). It emerges as an evolutionary response to promote survival and identify potential threats (Baumann and DeSteno 2010; Harmon-Jones *et al.* 2011) that promotes a hostile approach concerning violations that disregard individual freedoms highlighted in situations of self-relevance (Duhachek 2005; Gutierrez and Giner-Sorolla 2007). The behaviour that arises from anger stimulation aims to overcome the perceived threats to the self (Hutcherson and Gross 2011) and results in greater autonomic arousal, with an increased behavioural activation increasing risk taking and heuristic processing (Levenson, Ekman and Friesen 1990; Bodenhausen, Sheppard and Kramer 1994; Lerner and Keltner 2001; Lerner and Tiedens 2006).

Sadness is able to regulate interpersonal relations and improve prosocial functioning (Rivers *et al.* 2007), although the term sadness is often used to embody semantically complex concepts to illustrate feelings about a concept or situation (Enfield and Wierzbicka 2002). Sadness is traditionally caused when something is lost (Barr-Zisowitz, 2000); it ultimately enables control, energy and support to overcome the situation (Rivers *et al.* 2007). Mikolajczak *et al.* (2008) stated that adaptive coping

strategies can be catalysed by the promotion of sadness among other physical emotions.

Disgust is regarded to have the least amount of research which is attributed to its unattractive facets (Miller 1997). It promotes withdrawal tendencies focussed on self-degradation, contamination and immoral behaviour (Rozin *et al.* 1999; Duhachek 2005). Although categorised as a basic emotion (Shimp and Stuart 2004), disgust is regarded the forgotten emotion by many academics (Woody and Teachman 2000; Phillips *et al.* 1998; McNally 2002) and praised to be the basic emotion of interest for the 21st century research (Power 1997). The abilities as a marketing tool may be under estimated as linking an activity to disgust increases the association with increased rejection or avoidance (Rozin, Haidt and McCauley 1999). Disgust is known to arise from numerous sources (Keltner and Haidt 1999; Rozin, Haidt and McCauley 2009) which is an area that is not heavily researched with threat appeals and young adolescents. The main responses associated with disgust are withdrawal behaviours, negative affect and the promotion of avoidance behaviours from conditions that may cause harm (Woody and Teachman 2000; Panksepp 2007; Rozin, Haidt and McCauley 2009).

Although disgust is not the only under researched basic emotion (Ghingold 1981) more research is needed into the promotion of emotions such as shame, guilt and anger from persuasive advertising (Donovan and Henley 1997), in particular when threat appeal stimuli and appraisal elicit different emotions (Hutcherson and Gross 2011) need to be investigated. Until now disgust has only been compared to the non-moral emotion of sadness (Horberg *et al.* 2009) and research is needed to assess how not only the emotional response of sadness, but disgust and fear influence participants subsequent behavioural intentions and actions (Chuang, Kung and Sun 2008).

b) Social emotional responses

Social emotional responses are often regarded as self-conscious secondary emotions that occur in interpersonal contexts, intimately connected to the self and the social environment such as relationships with others (Baumeister, Reis and Delespaul 1995; Miller 1995; Tangney *et al.* 1996; Damasio 2002). Self-conscious emotions are characterised viewing behaviour through the eyes of another (Crozier 1998) being associated with criticism by others and involving rejection or disapproval (Lewis 1974; Ferguson *et al.* 1999). Formed from social construction through social definitions (Groppel-Klein 2014), the emotions are amplified in social situations concerning family or close friends (Agrawal, Menon and Aaker 2007). There has been an increase in interest in the self-conscious emotions (Tracy, Robins and Tangney 2007); primarily as psychologists argue they can lead to pro-social, cooperative behaviours (Ketelaar and Tung 2003). Shame and guilt are most frequently termed self-conscious, moral emotions (Kroll and Egan 2004; Tracy and Robins 2004) largely due to their altruistic behaviour and abilities to inhibit anti-social behaviour (Tangney, Stuewig and Hafez 2011), reciprocating a sense of responsibility to uphold moral norms regarding ones behaviour towards others (Tangney 1992; Eisenberg 2000). As people often use the words shame, embarrassment and guilt interchangeably (Wolf *et al.* 2010; Lickel, Steele and Schmader 2011), shame has subsequently received least attention in the past, being mistaken as a synonym for guilt (Eisenberg 2000). Despite the traditional view that the emotions describe the same affect, being self-conscious, morality-based and self-referential emotions associated with the desire to reprimand previous actions (Tomkins 1963; Smith and Ellsworth 1985; Frijda, Kuipers and ter Schure 1989). Social emotions are distinct emotions that promote divergent functional outcomes (Tracy and Robins 2006) in

terms of their situational antecedents, motivations they evoke, associated appraisals, experiential aspects and resultant action tendencies (Ferguson, Stegge and Damhuis 1991; Ferguson *et al.* 1999; Lickel *et al.* 2005).

A shameful experience is deemed more devastating, painful and long lasting than guilt (Sabini and Silver 1997; Giner-Sorolla, Kamau and Castano 2010), which originates from the evaluations of the core self rather than behaviours (Tangney, Stuewig and Mashek 2007). The private-public debate around the nature of shame, embarrassment and guilt has been emphasised throughout the literature (Smith *et al.* 2002; Wolf *et al.* 2010; Tangney, Stuewig and Hafez 2011) with shame seen as an affective reaction that follows public exposure of a socially inept behaviour, whereas guilt concerns one conscience about breaking private, personal moral standards, social norms and the violation of personal duties (Gehm and Scherer 1988; Tangney 1996; Keltner and Buswell 1997). While guilt is frequently associated with approaching others who were hurt and making amends, shame is often linked to attempts to escape and avoid looking at others (Ferguson, Stegge and Damhuis 1991). These results point out the necessity of researching how adolescents' social-emotional responses influence behavioural measures from different threats. Although shame has not generated a great amount of research (Heaven, Ciarrochi and Leeson 2009), the recent rise in research into the emotion of shame (Rizvi 2010) is due to the perception that it is one of the moral emotions that motivate pro-social behaviour (Goldberg 1991; Emde and Oppenheim 1995). Shame is concerned with self-reflection (Lewis 2003) characterising it as a 'social' or 'self-conscious' emotion (Tangney and Fischer 1995; Crozier 1998) which is linked to hiding and social withdrawal. The negative self-evaluation results from public exposure of defect, failure or transgression (Smith *et al.* 2002). Shame is the most self-conscious emotions of human emotions (Lewis 1974;

Tangney 1991; de Hooge, Breugelmans and Zeelenberg 2008) promoting an 'ugly feeling' (Tangney 1991; p. 600) and has the power to influence social interactions, values, and behaviours (Gilbert 2003). With there being a link between shame and anger which occurs as a blame factor beyond one's misfortune (Bennett, Sullivan and Lewis 2005; Tangney, Stuewig and Mashek 2007), factor analysis will establish the classification of the different emotions monitored.

As with other moral emotions, guilt is used in multiple and conflicting ways representing 'an interpersonal phenomenon that is functionally and causally linked to communal relationships between people' (Baumeister *et al.* 1994; p. 243). Guilt represents an emotional response different from fear and anger due to self-reported blame (Baumeister, Stillwell and Heatherton 1994). Guilt is experienced when negative aspects of behaviour are emphasised (Tracy and Robins 2006; Lewis 2008). Although psychologists have widely investigated how the feeling of guilt can influence behaviours, there is limited research that investigates the persuasive effects of negative emotional appeals, especially guilt (LaBarge and Godek 2005). The role of guilt in the marketing domain presents an 'affect triggered by the anxiety of consumer experience upon the cognition that is transgressing a moral, societal or ethical principle' (Lascu 1991; p. 290). Guilt is based around negative feelings about behaviour (Wolf *et al.* 2010) which has been shown to influence pro-social, moral and reparative behaviours (Baumeister, Stillwell and Heatherton 1994). This shows guilt has the ability of persuading and influencing decisions, feelings and actions towards certain behaviours (Lascu 1991; Baumeister, Stillwell and Heatherton 1994).

Need for more emotion research

Although there is paucity in research investigating how emotions influence moral judgements (Huebner, Dwyer and Hauser 2009; Horberg *et al.* 2009), the effectiveness of investigating this with adolescents is not widely known. With a drive for the 'emotionalisation of advertising' within research (Haimerl 2008) there is a gap for research to investigate how emotions depicted in an advertisement affect the viewer's response throughout advertising (Maclnnis and Stayman 1993; Groppel-Klein 2014). This will provide specific results to adolescent son how 'specific emotions motivate people to behave in different ways, leading to different behaviours' (de Hooge, Zeelenberg and Breugelmans 2007; p 1037). This research will contribute to the under-researched area, providing an understanding of how emotions influence adolescents' responses to advertisements (Vanhamme and Chung 2008; Groppel-Klein 2014). There is a need to research a wider range of emotional states than traditionally investigated with threat appeals to widen the scope of discrete emotions used in advertising (Roseman, Wiest and Swartz 1994; Groppel-Klein 2014). Especially the way emotions interact with message features to influence persuasion and behaviour intentions which are not fully understood (Aaker and Williams 1998; Maheswaran and Chen 2006). Although there is considerable research into the negative emotion of fear, there is considerably less into the other negative emotions of disgust and anger (Olatunji and Sawchuk 2005), shame and guilt (Ghingold 1981; LaBarge and Godek 2005; Heaven, Ciarrochi and Leeson 2009) showing research is needed as anti-smoking public service announcements frequently employ negative emotions to induce responses. Theoretical research understanding the relationship between coping response and emotional responses will provide knowledge to

overcome the boomerang effect (Wolberg 2006). Showing the need to research how physical and social emotional responses simultaneously influence adolescents' self-reported behavioural responses. The role that the two clusters of emotions (physical and social) have on behaviour is investigated to see how both types of emotional responses influence adolescents' post exposure responses to both threat appeals. This is approached through a selection of exploratory hypothesis central to the sixth proposition:

> ***Proposition #6: 'The type of emotional response will influence post exposure response'***

3.6 Summary

This chapter describes the development of the conceptual model and describes the final three research propositions. The influential theories upon the model are discussed showing how it takes into consideration social learning theory, health models, and threat appeal theories and uses behaviour change models to support sample selection thus improving the efficacy of the model with adolescents. Message processing and how alternative negative emotions influence processing is provided to show the importance of acknowledging different clusters of emotional responses. This is discussed alongside the developed critical response value classification that estimates and evaluates how coping response to the threat appeal influences self-reported behaviour. The role of intentions and attitude variables being able to estimate actual behaviour change are provided. The next chapter discusses the philosophical underpinnings; outline the methods used in data collection, analysis and questionnaire formation supported by the iterations from the preliminary manipulation tests.

Chapter Four

Research design, methodology and questionnaire development

4.1 Introduction

This chapter serves three purposes concerning research design, methodology and the iterative questionnaire development. Initially the research paradigm and the underlying philosophical assumptions and research design approach are provided. This is followed by the data collection method, questionnaire development and data analysis techniques. To conclude the preliminary manipulation checks that influenced the questionnaire iterations are provided.

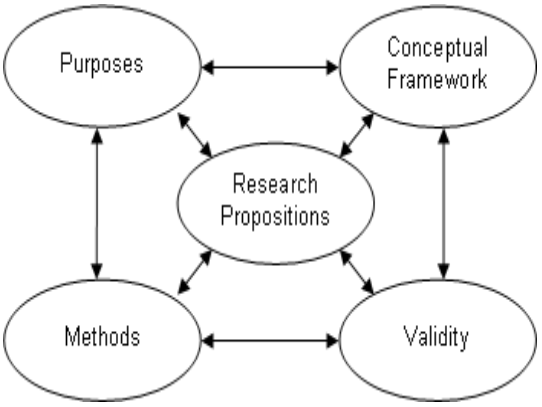
4.2 Philosophical assumptions and research design

The rise in pragmatism (Greene, Caracelli and Graham 1989; Gelo, Braakmann and Benetka 2008) has labelled the philosophical paradigm the third research movement alongside the disputed positivism and constructivism (Tashakkori and Teddlie 1998; Johnson and Onwuegbuzie 2004). The pragmatic paradigm holds no allegiance to a single research framework (Greene and Caracelli 2003). It focusses on achieving objectives rather than the philosophical mumbo jumbo (Miles and Huberman 1994), thus rejecting the incompatibility thesis (Tashakkori and Teddlie 2003) and acknowledges that 'all paradigms may be equally valuable to guide scientific research' (Gelo, Braakmann and Benetka. 2008; p. 278). Supporting the principle of methodological pluralism; pragmatism enables the investigator to utilise research

methods to suit the objective (Willems and Raush 1969) and research should use more than one method to solve the problem, not holding an allegiance to a certain paradigm using methods to achieve research aims (Howe 1988; Williams 2000). Ultimately the researcher needs to evaluate the most appropriate method to answer the question (Morse 2003) and 'opens up inquiry to all possibilities' (Maxcy 2003; p. 86). This research embraces quantitative researches ability to provide validity and generalizability (Onwuegbuzie 2003) rooted with measurable and observable proof that establishes causality and generalisation (Blaikie 1991).

Alternative approaches and research designs have been proposed throughout the literature (Maxwell and Loomis 2003; Teddlie and Tashakkori 2006) that overcomes the limitations characterised by typologies by combining multiple research paradigms into a cohesive framework (Greene, Caracelli and Graham 1989; Caracelli and Greene 1997; Tashakkori and Teddlie 1998). The interactive model of research design proposed by Maxwell (1996) acknowledges the research objectives, components and relationship through five components central to the research described in Figure 4.1.

Figure 4.1 Interactive Model of Research Design
(Maxwell and Loomis 2003)



Although the components are prevalent in other research designs (Robson 1993; Miles and Huberman 1994) and appears similar to the systems model (Maxwell and

Loomis 2003). This design holds the research propositions and objectives at its core as all components integrate and interact cohesively to achieve them (Maxwell 1996).

4.3 Experimental Design

The study uses a 2 (Social Threat Versus. Physical Threat) x 2 (Non-Smoker Versus Smoker) between subjects full factorial experimental design to remove the chance of repetition and carryover effects, with a further manipulated based on their critical value coping response critical value classification. The independent variables are: type of threat; Social Threat (STr) and Physical Threat (PTr), Smoking classification; Non-Smoker (NS) and Smoker (S) with the Coping Response Critical Value; Emotion Control (EC) and Danger Control (DC). The dependent variables are: Future Smoking Attitude (FSA), Future Smoking Intentions (FSI) and Future Smoking Intent to Quit (FSIQ). The research model includes moderating variables: coping response Critical Value (CV), Physical Emotional Response (PEm), Social Emotional Response (SEm) Susceptibility to Peer Pressure (SPP) and Parental View on smoking (PV) and mediating variables: Attention to the advert (ATAD), Attitude to the advert (AAD), message derogation (MD) and the Perceived Level of Threat towards the advert (PLT) all of the variables are interval-scaled.

Operationalization of the independent variables

The independent variable of type of threat was operationalised using a number of dimensions in the preliminary manipulation tests assessing the perception of threat, the rating of threat and the associated emotional response. The type of threat

classification assessments was adopted from Schoenbachler and Whittler (1996) and tested throughout the preliminary tests. The second independent variable was the smoker classification, with those that have smoked at least one puff classified as a smoker, whereas those that have never tried classified as a non-smoker (Pierce *et al.* 1996). Although a previous study split adolescents into three different groups; current smoker, previous smoker and non-smoker (Hu and Bentler 1998), due to the age and stage in the smoking models (Albaum *et al.* 2002; Kremers, Mudde and de Vries 2004) the dichotomous approach is sufficient. The independent samples were analysed with the critical value manipulations to assess the coping responses.

Research stimuli exposure

Although previous research created static stimuli to illustrate threat appeals (Arthur and Quester 2004; Smith and Stutts 2006; Dickinson and Holmes 2008), the reliability for adolescents is not supported and regarded inappropriate. Considering new unseen warnings and anti-smoking advertisements attract greater attention than previously published ones (Krugman *et al.* 1994), the content needs to be interesting, attention-capturing and culturally sensitive (Blumberg 2000). Threat appeals are a combination of graphic images and words which are shown to produce greater recall than just advertisements with words (Purdy and Luepnitz 1982). The threats were developed acknowledging findings from previous research that pictorial warnings affect intention to smoke significantly more than text-only warnings (Menon, Block and Ramanathan 2002), with visual warnings alongside verbal warnings increasing discouragement from smoking and increased intentions to quit (Kees *et al.* 2006). As administered in previous research four exposures were manipulated in the final

research; two physically threatening stimuli and two socially threatening stimuli congruent with adolescent views. To ensure accurate content, iterations are essential to develop, test, target, and monitor exposure (Krugman *et al.* 1994). The iterative process created and tested different threat appeals with two messages: one socially framed message and one physically framed message. In order to ensure the message, image and content is suitable for the target segment, audience segmentation and market research is paramount to a successful social marketing campaign, showing the need 'to put the audience at the centre of every decision' (Pirani and Reizes 2005; p. 134). Stimuli control measures ensured that the advertisements are comparable in length, logos, headlines and message sources (Sternthal and Craig 1974) and contained simple messages, large type and graphic images that are regarded effective at communicating the risks of smoking with adolescents (Fischer *et al.* 1993). The introduction of a logo illustrating a pseudo tobacco warning brand (Strahan *et al.* 2002) was implemented. Although previous research has varied from having no time restraint (Dickinson and Holmes 2008) to only allowed participants to witness a stimuli for 2 seconds (Pechmann and Knight 2002). The stimulus was presented for a controlled amount of time of 30 seconds as implemented by Stayman and Aaker (1988) to ensure comparable results.

Sample profile and minimum sample size

The participants' were aged between 11-13 years to ensure the results are applicable to the research objective and stage in the smoking behaviour models (Albaum *et al.* 2002; Kremers, Mudde and de Vries 2004). The participants' were from a mixture of comprehensive and grammar schools in the South East of England. The mixed

schools provided an improved generalizability of the population sampling students from various socio-economic backgrounds. Although the importance of overcoming sample bias is well regarded (Morgan 1998), this segmentation criteria creates a sample bias and reduces any general population representativeness. But, due to the specific research objective, this homogenous age group need only be investigated. The homogeneity of participants is vital to uncovering adolescents' behavioural intentions and attitudes dependent on smoking classification and threat appeal witnessed while aged 11-13 years old.

Previous experimental design threat appeal studies have used sample sizes from different ages, different schools and different socio economic backgrounds. To the best of the author's knowledge, no research has compared 11-13 years olds non-smokers' responses to smokers' responses. Considering reports state that 35% of adolescents' in the UK have tried smoking by age 13 with 11% regularly smoking, a large sample is needed. This is not adopted in previous threat appeal research, but ensures a statistically valid proportion of smokers are collected to compare against non-smokers. Central limit theorem suggests that when the sample size is large enough the sampling distribution is more approximate to normal regardless of the population distribution. Hair *et al.* (2006) described that a minimum of 20 participants per manipulation cell is sufficient to overcome this, which is consistent with sample sizes used in recognised academic marketing journals. This suggests that to be statistically valid, at least 200 participants are needed in each sample (5 manipulations x 20 observations). In order to obtain this at current smoking rates, at least 2000 pupils will need to be surveyed to obtain an estimated 10% (n=200) smokers enabling comparative research findings and overcome incomplete and invalid responses.

4.4 Research instruments and construct measurement

The data collection method follows approaches used in previous threat appeal research (Insko, Arkoff and Insko 1965; Rippetoe and Rogers 1987; Schoenbachler and Whittler 1996; Chebat and Daoud 2003; Smith and Stutts 2003; Dickinson and Holmes 2008) and utilises web based data collection instruments (Madrigal and Bee 2005). A combination of 'web-based experiment' and hard copy questionnaires was administered in a school computer laboratory with a member of staff present (Slater and Kelly 2002; Ruiter and Kok 2005). The questionnaire was structured into sections with items adapted from previously developed scales and modified to be suitable for adolescents. Items were randomised to control for order bias. The questionnaire included an introduction statement about the research and the items collected through the commonly used self-reported behaviour scales (Holm, Kremers and de Vries 2003). Prior to participations all participants received a letter of consent to overcome ethical and legal issues and school reports presented post participation.

Ethics of threat appeals research

The ethics of investigating threat appeals is a constant issue being raised among researchers in the marketing field. A continuous debate exists about how marketing influences adolescents with concerns on unethical exposure and moral anxieties (Snipes, LaTour and Bliss 1999). Social marketing remains an ethical and controversial topic (Manyiwa and Brennan 2012); as marketing has been used to unfairly manipulate adolescents (Brucks, Armstrong and Goldberg 1988). The major

concern arises from unwillingly exposure to harmful and graphically upsetting images from unexpectedly witnessing a threat appeal (Hyman and Tansey 1990; Hastings *et al.* 2004). The unethical exposure of images prompted the ITC Advertising Standards to impose a code of conduct on the use of fear in television advertising (Hastings, Stead and Webb 2004). The research complied with the University of Kent ethics approval procedures and participants debriefed and letters of consent administered in conjunction with the school prior to participation provided in Appendix A.2.

Self-reported behaviour

Anti-smoking studies raise concern among adolescents who are underage to legally smoke with previous research highlighting that adolescents face pressures to misreport smoking behaviour due to possible reprisals (Dolcini, Adler and Ginsberg 1996) showing the need to ensure anonymity. Self-report tools are widely used in marketing research (Holm, Kremers and de Vries 2003), especially within behavioural decision making models (Armitage and Conner 2001) being the most common method for assessing adherence to behaviour in research (Stirratt *et al.* 2015). The reason for this is that they are easy to administer, unobtrusive and possess the ability to capture rich information regarding cognitive, emotional and behavioural responses (Hastak 1990; Stayman and Aaker 1993; Lucas and Baird, 2006). Although constantly debated (Dolcini, Adler and Ginsberg 1996), being frequently criticised since early psychological assessments (Allport 1927) to recent publications (Dunning, Heath, and Suls, 2005; Paulhus and Vazire 2009). Self-reports are regarded to be susceptible to faking (Day and Carroll 2008) and provide inaccurate information (Paulhus 1991; Robins and John 1997). That being said, researchers frequently rely on self-report

measures to assess prevalence of behaviours and evaluate program effectiveness. To overcome the concern of under-reporting health-risk behaviours (Dolcini, Adler and Ginsberg 1996) some research uses technology or biological indicators to overcome the bias (Bauman, Koch and Bryan 1982; Bauman and Dent 1982; Murray *et al.* 1987; Hansen 1992; Dolcini, Adler and Ginsberg 1996; Stirratt *et al.* 2015) that is frequently applied in research with adult smokers (Murray *et al.* 1987; Luepker *et al.* 1989). Self-reports are employed due to the situation, budget, time restraint, sample and the reliability of self-reports for those of 10 years of age perceived to be more reliable than younger adolescents (Kuijpers *et al.* 2014). As Verplanken and Aarts (1999) described that single item self-reported behaviour scales are not the optimal measures in terms of reliability and validity, which provides the opportunity to alter or bias responses (Armitage and Conner 2001; Stayman and Aaker 1993) the research uses a number of multiple items scales to assess future self-reported behaviour responses.

Questionnaire Design

The questionnaire was created through an iterative approach, adapting previous scales, including new items and amending phrasing to suit the young adolescent segment. The questionnaire references are provided in Appendix A.3 which is followed by the advert stimuli iterations in Appendix A.4. The questionnaire iterations throughout the preliminary tests culminated to the questionnaire in Appendix A.5 which is structured in nine sections:

a) Introductory information

The opening questions are generic classification questions to establish gender and age, followed by questions adapted from EFSA baseline questionnaire (de Vries *et al.* 1995) about the school they attended and their school motivation to assess school engagement (Pyper *et al.* 1987; Abroms *et al.* 2005). School motivation has been highlighted in previous research (Hu, Lin and Keeler 1998; Simons-Morton 2004), with results showing that academic engagement decreased the likelihood of experimentation (Abroms *et al.* 2005).

b) Smoking intentions and attitudes

The second cluster obtains smoking intent and smoking attitude providing a baseline measure of prior behaviour to enable predictions of later actions (Ajzen 2002) that influence future smoking behaviours (Chassin *et al.* 1984; McNeill *et al.* 1989). This has been highlighted as an important aspect in previous research (Maddux and Rogers 1983; Pierce *et al.* 1989; Pechmann *et al.* 2003; Holm, Kremers and de Vries 2003; Gilpin *et al.* 2007). Although intentions and expectations differ in behavioural responses, a compiled scale provides a reliable description of behavioural intentions than a singular scale (Sheeran 2002). The intent scale was influenced by existing research that uses scales from one to five items (Pierce *et al.* 1996; Anderson *et al.* 2002; Holm, Kremers and de Vries 2003; Tangari *et al.* 2007; Pechmann *et al.* 2003; Gilpin *et al.* 2007; Pechmann *et al.* 2005; Carvajal *et al.* 2004; White, Webster and Wakefield 2008; Samu and Bhatnagar 2008). The statements are presented on a five point Likert scale regarding the likelihood of the statements.

Obtaining smoking attitude has been under researched in adolescents; the scale was influenced by Michaelidou *et al.*'s (2008) questioning tool. Adaptations are made to ensure the scale is relevant to adolescents alongside additional items influenced by Kremers *et al.* (2004) items on smoking related beliefs, aspects concerning social factors (Dinh *et al.* 1995; Chassin *et al.* 2003; Carvajal *et al.* 2004) and research concluding that adolescents' think smokers are cool influencing stronger intentions to smoke (Norman and Tedeschi 1989; Pechmann and Ratneshwar 1994). The statements are presented on a five point Likert scale regarding the likelihood of each statement.

c) Susceptibility to peer pressure

The third section of questions obtained social influence and susceptibility to peer pressure. This was influenced by Abroms *et al.*'s (2005) scales to assess social outcome expectations from smoking. Further items obtained the presence of smokers in their social environment, initially the number of peers smoking influence was obtained through the number of closest friends that smoke (Abroms *et al.* 2005; Chassin *et al.* 2000) and the influence of friends and family smoking rates (Conrad, Flay and Hill 1992; Alexander *et al.* 2001; Holm, Kremers and de Vries 2003; Smith and Stutts 2003; Kremers, Mudde and de Vries 2004). The statements were presented on a five point Likert scale regarding levels of agreement.

d) Smoking behaviour

The fourth section obtained smoking behaviour. Although Pierce *et al.* (1989) and Chassin *et al.* (2000) provide scales confirming smoking experience over a number of items improving self-reporting efficacy, prior research uses dichotomous question

about having ever tried smoking once (Smith and Stutts 2003; Chebat and Daoud 2003; Dickinson and Holmes 2008).

e) Parental view on smoking

The fifth section about parental view on smoking was obtained as advised by Chassin (1996) who raised the importance of obtaining parental smoking influence. Family smoking habits are one of the most influential factors (Conrad, Flay and Hill 1992) with adolescents being at a higher risk of smoking initiation when parents are less involved (Simons-Morton *et al.* 2001), as authoritative parental practices reduce smoking onset among adolescents (Krosnick *et al.* 2006). The items extended Pyper *et al.'s* (1987) instrument and included Abroms *et al.'*s (2005) suggestions to report perceived parental views on smoking statements. The scales were anchored on a 5 point Likert scale regarding level of agreement of the statements.

f) Threat appeal observation

Participants witnessed one of the threat appeal manipulations and reported which one witnessed. The classification of each threat appeal was assessed to ensure accurate manipulations. Preliminary manipulation tests checked the perceived classification of each threat appeal. Although previous studies did not check the classification of each threat, the perceived threat classification and the perceived level of threat was obtained through a 5 point Likert scale (Smith and Stutts 2003; Dickinson and Holmes 2008).

g) Emotional response

This section obtained the amount of emotion response felt from the watching the advert, although within the marketing discipline there exists a large array of emotional measures that are adapted from psychology (Machleit and Eroglu 2000) being highly challenging and subjective (Groppel-Klein 2014). The most frequently used methods are self-reported tools such as adjective checklists, thought listings and post exposure self-reports (Holbrook and Batra 1987 Stayman and Aaker 1988; Stayman and Aaker 1993; Groppel-Klein 2014). Like previous research this study assessed the negative emotions; sadness, fearful, disgust, anger and shame (Dickinson and Holmes 2008) and additionally embarrassment and guilt. In order to assess how the threat appeal influenced emotional moods from watching the stimuli, items used in previous research were employed (Holbrook and Batra 1987; Machleit and Eroglu 2000; Botti, Orfali and Iyengar 2009) obtaining how strongly each emotion as felt from watching the advert rated on a Likert scale anchored 1-5 (Agrawal, Menon and Aaker 2007). Each emotion response was rated on a scale ranging from not at all to a lot as conducted by other emotion research (Plutchik 1980; King and Reid 1989; Schoenbachler and Whittler 1996; Agrawal, Menon and Aaker 2007, Izard 2009). Due to the emotional response being retrospective with the respondent recalling how they felt (Hazlett and Hazlett 1999) the response is asked immediately after witnessing the threat appeal.

h) Critical value coping response

Coping response scales are heavily used with adults to measure the ability to abstain from a previous behaviour, rather than adolescents not taking up behaviours and

provide a coping response classification (Rosenstock 1966; Lawrance 1988; Prochaska *et al.* 1991; Nutbeam and Harris 1998; Weiss 1999; Etter, Bergman, Humair, and Perneger 2000; Dickinson and Holmes 2008; Bolger *et al.* 2010; Bello *et al.* 2011). The problems with assessing coping responses are widely recognised (Compas *et al.* 2001) and the 49 item maladjustment scale used to measure maladaptive behaviours (Weiss *et al.* 2006) is regarded unpractical for adolescents. As was Dickinson and Homes' (2008) scale that unreliable with young adolescents from preliminary tests. The scale is an amalgamation of previous items from health models and maladaptive coping response scales obtaining items for perceived threat and perceived efficacy that assessed how exposure to the anti-smoking message influenced behaviour (Bhatnagar and Samu 2009). Perceived-efficacy items were adapted the smoking self-efficacy measure (Prochaska *et al.* 1991) and self-efficacy questionnaire (Etter *et al.* 2000) by rating confidence and ability to abstain from smoking for each statements influenced from previous research (Holm, Kremers and de Vries 2003; Kremers, Mudde and de Vries 2004; Bolger *et al.* 2010; Bello *et al.* 2011). Perceived threat employed items that were influenced by Rogers (1975) and Witte's (1990) research. The responses were captured on five point Likert scale monitoring levels of agreement for each statement.

i) Message processing responses

The message processing factors consisted of three items; attitude towards the advert, attention towards the advert and message derogation. The scales were developed using items recommended in the literature (Mitchell and Olson 1981; Gardner 1985; Hill and Mazis 1986; MacKenzie, Lutz and Belch 1986; Holmes and Crocker 1987; Madden, Allen and Twible 1988; Donthu 1992). The attitude towards the advert items

were influenced by Beltramini's (1982) 'advertising believability scale' that consisted of semantic differentials which assumes that the more someone likes an advert the increased likelihood to accept the message (Marchand 2010). The final scale was influenced by Gardner, (1985), Mackenzie *et al.* (1986) Holmes and Crocker (1987) and Donthu (1992). The attention towards the advert was captured from Bhatnager and Samu (2009) single item that was developed into a multi-item scales from suggestions from the literature (Duncan and Nelson 1985; Block and Keller 1995; Smith *et al.* 2007; Thompson *et al.* 2011). The message derogation was made from items phrased differently to the attitude towards the advert items previously used in pre-tests (Mitchell and Olson 1981; Madden, Allen and Twible 1988; Duncan and Nelson 1985).

j) Future smoking intentions and attitudes

The initial item obtaining self-reported behavioural expectations from exposure (Smith *et al.* 2007; Smith *et al.* 2008) was replaced with two scales depending on smoking behaviour; non-smokers' completed a future smoking attitude and then future smoking intent scale, while smokers' completed future smoking attitude scale and a future intent to quit smoking scale. All the scales were rated on a five point Likert scales obtaining likelihood of each statement. The future smoking attitude scale were influenced from the initial smoking attitude scale, to ensure comparability from base line and after exposure, with changes to the phrasing of the items used as recommended by Chassin *et al.* (2003); Carvajal *et al.* (2004); Michaelidou (2008) Samu and Bhatnagar (2008). The future smoking intent was about perceived future intent to smoke; the items were influenced by the initial smoking intent scale and previous research (Pechmann *et al.* 2003; Gilpin *et al.* 2007; White, Webster and

Wakefield 2008; Pierce and Gilpin 1996). The future intent to quit smoking questions was adapted from previous research with smokers (Tangari *et al.* 2007; Emery *et al.* 2000).

4.5 Data analysis techniques

The quantitative methods employed to analyse the data are described providing an inductive process to interpret the phenomena under investigation (Ritchie and Lewis 2003). Where possible validity of the research methods are provided which is frequently addressed in the literature (Tashakkori and Teddlie 2003). Initially the process for missing data is explained, followed by the factor analysis techniques of exploratory, confirmatory and structural modelling concluded by a summary of the other statistical tests utilized throughout the research.

Missing data

There is no clear guideline regarding what forms a large amount of missing data (Bryne 2010). Little and Rubin (1987) described that there are three patterns of missing data; missing completely at random (MCAR), missing at random (MAR) and non-ignorable missing at random (NMAR). The most popular method to deal with these issues is list wise deletion, which is the fastest and simplest (Bryne 2010), although assumes the data are MCAR (Brown 1994; Arbuckle 2007). Taking this into account observations were deleted if participants had not completed the emotion scale, perceived threat, perceive efficacy or post exposure behavioural smoking scales as practiced in previous research which reduced observations that had a certain

percentage of crucial missing items (Ickes and Sharma 2012). The list wise deleted technique was implemented, reducing the observations from 2237 respondents by 18% to 1837 respondents, although above the industry average amount of 10% it is regarded that each study has different reasons for missing values (Kline 1998). Issues included time restraints, IT equipment and differing levels of participant ability. All the observations with missing values were removed from the data set, while 10 observations were removed from the smoker sample that missed 1 incomplete scale. Using the pattern matching approach with the mean imputation (Bryne 2010) the 10 observations values were replaced with the mean value per manipulation *(n=5)*. This overcame the problems that would prevent the structural equations modelling to be completed which are not possible when the covariance structure is formed from incomplete data (Bentler and Chou 1987).

Factor Analysis

Factor analysis is made of a number of stages; initially two phases of factor analysis are conducted to ensure each scale is represented by a unique factor reducing any possible cross loadings followed by the structural equations modelling. The phased approach is widely recommended to test the hypothesised model (Manyiwa and Brennan 2012). Factor analysis is frequently used in experimental fields throughout the social science with the prevalent method being for interpreting self-reported questionnaires (Hogarty *et al.* 2005). Factor analysis uses the common variance; covariance and communality, that each observed variable shares with the other observed variables (Bryne 2010). To increase the reliability of the analysis sub samples between 20-30% of the data set are extracted for the Exploratory Factor Analysis (EFA) then the remainder 70-80% of the sample is used for the

Confirmatory Factor Analysis (CFA) to validate and amend the initial assumptions (Gerbing and Hamilton 1996). Although applying the EFA findings to CFA should be done with caution (MacCallum *et al.* 2002; de Winter, Dodou and Wieringa 2009). Exploratory factor analysis is a useful heuristic strategy for model specification prior to cross validation with confirmatory factor analysis that is shown to provide better research outcomes (Gerbing and Hamilton 1996). The structural equation models are conducted with the complete data set 100% implementing the recommendations from the iterative factor analysis process that proposed reliable scales and factors.

There are two recommendations about the minimum sample size; the absolute number of cases and the subject-to-variable ratio (Velicer and Fava 1998; MacCallum *et al.* 1999). Although the rule of thumb about minimum sample size is not always valid (MacCallum *et al.* 2002; Hogarty *et al.* 2005), it is important to acknowledge advice about the sample size. The factor analysis samples meet the minimum requirements of having at least 100 observations (Comrey and Lee 1992; Hatcher 1994), with all samples randomly selected to contain at least 150 observations that are shown to provide a convergent and reliable solution (Gerbing and Anderson 1985). Inconclusive recommendations also exist for the sample to variable ratios, the 'rule of thumb' ranges from a minimum of 3:1 to 20:1 (Hair *et al.* 2006). All factor analysis samples had acceptable ratios, with the smoker data set being 4:1 and the non-smoker sample was 11:1. Although concern must be taken when using the guidelines as research into factor analysis sample size and ratio has shown 'that there was not a minimum level of *N* or *N:p* ratio to achieve good factor recovery across conditions examined' (Hogarty *et al.* 2005, p.222) showing it is ultimately down to the

researcher preference and circumstances being used as a reference point rather than concrete requirements.

a) Exploratory Factor Analysis

Exploratory factor analysis determines the number of factors that account for the correlations in the R-matrix (Gray and Kinnear 2012). Computed using the Promax rotation on SPSS (v.20.0) to better represent the complexity of the examined variables as constructs in real life are rarely uncorrelated (Harman 1976). This rotation allows the axis to be non-orthogonal and represents correlated and oblique factors (Gray and Kinnear 2012). Once the model was estimated, the process for elimination included: low communality, low factor loading, cross loading on more than one factors, not loading on any factor, while ensuring at least three items per factor and retaining as many items as possible acknowledging theoretical assumptions about the factor (Velicer and Fava 1998; Costello and Osborne 2005). A factor with fewer than three items is regarded statistically weak and unstable, as the two variables causes' bias in the factor parameter estimates which nearly vanishes when more than three items are retained (Gerbing and Anderson 1985; Costello and Osborne 2005). Further measures of sampling adequacy and reliability provided support to remove items. Communalities of 0.4 to 0.7 are common in behavioural or social data (Costello and Osborne 2005) although those lower should be removed. There for items that loaded below 0.3 on the communalities table were removed during an iterative approach to remove items to obtain a reliable pattern matrix. After assessing communalities for sampling adequacy, the factor score coefficients that describe how the item loads on a certain factor were assessed, while taking into consideration Tabachnick and Fidell (2001) recommendation of including items that loaded above 0.30 with loadings in

behavioural or social data being between 0.3 and 0.5 (Hair *et al.* 1995; de Winter, Dodou and Wieringa 2009).

b) Confirmatory factor analysis

The confirmatory factor analysis assesses the predetermined number of factors and how they load on each factor (Gray and Kinnear 2012), with the objective to determine the adequacy of the model and goodness of fit to the sample data (Bryne 2010). The approach falls into the model-generating classification provided by Joreskog (1993) which is the most common of the three factor analysis approaches (Bryne 2010). The CFA was computed using the AMOS software (v.20.0). If the variables are reliable with strong effects and the model not being overly complex, smaller samples are acceptable (Bollen and Stine 1990). Initially parameter estimates were reviewed then fit indices and residuals outlining model modifications to increase fit and achieve a more parsimonious model. It is imperative to explain why modifications were completed and how it improves the model. Caution must be taken when removing items, especially as 'when an initial model fits well, it is probably unwise to modify it to achieve even better fit because modifications may simply be fitting small idiosyncratic characteristics of the sample' (MacCallum, Roznowski and Necowitz 1992; p. 501). Evidence of misfit are captured in the modification indices representing correlated errors which are systematic, rather than random measurement error and may be caused by the items or the respondents (Aish and Joreskog 1990). The modification index estimates an improvement in overall fit if a correlation path was added (Kline 2011), although Bryne (2010) suggested to correlate the errors, this must be supported by strong substantive and empirical rational (Joreskog 1993), therefore the items with large modification index were removed to reduce the overlap

in item content, which appears when items essentially repeat the same question (Bryne 2010). There are no strict rules about how to alter modification indices, although the greatest indices should be considered first, with iterations conducted one at a time (Raykov and Marcoulides 2010) as a single change can affect other parts of the solution (Joreskog and Sorbom 1996). The modifications to the model was done in an iterative manner removing the greatest index one at a time, with particular attention given to the items with multiple modification indices. The over-determination of factors (factor-to-variable ratio) highlighted by (MacCallum *et al.* 2002) was assessed, especially for those factors with over 5 items (MacCallum *et al.* 1999). This was primarily achieved by assessing the factor loadings, which was assessed simultaneously while reviewing the modification indices. Although the factor loading level threshold is dependent on the researcher's preference (Tabachnick and Fidell 2007), attention was paid to ensure no items were lower than the minimum 0.30, acknowledging that when having 5 or more items per factor it is desirable to load around 0.50 (Costello and Osborne 2005).

Convergent, Discriminant Validity, Reliability and Linearity tests

A two-step procedure provides methods to monitor scale validity (Gerbing and Anderson 1985) that is used throughout both approaches. Composite reliability establishes internal consistency and requires a value close or above a 0.7 threshold (Fornell and Larcker 1981). The average variance explained assesses the convergent validity and represents the percentage of variance in a measure from the hypothesized factor trait (Fornell and Larcker 1981) and requires a value close or above a 0.50 threshold (Hair *et al.* 2006). Convergent validity is proven if the factor loadings are significant (Hair *et al.* 2006) and discriminant validity assessed by the average

variance explained requiring a greater variance with its indicators than with other constructs. This is assessed if the average variance explained square root is superior to the estimated squared correlation among each pair of constructs (Fornell and Larcker 1981). The chi-square difference test assesses that when the factors co-vary that the model is a worse fit, using the Yates chi-squared test that estimates an increase of greater than 3.86 per degree of freedom provides adequate model fit (Camilli and Hopkins 1978). The scale reliability is assessed through the Cronbach alpha statistic providing a measure of the internal consistency of a test or scale with different reports stating the acceptable values of alpha, ranging from 0.70 to 0.95 (Tavakol and Dennick 2011). Although the majority suggest minimum value of near 0.7 (Nunnally and Bernstein 1994), alpha's equal to or greater than 0.6 are acceptable (Murphy and Davidshofer 1988) as the lowest end of the threshold suggests that coefficients of 0.35 or less represent low reliability (Nunnally 1978). Common method variance refers to possible contamination ensuing from the use of a single measurement method: It can exaggerate the apparent association between two constructs measured with the same method (Wiggins, 1973) which often happens to large data sets composed entirely of self-reports (Paulhus and Vazire 2009) or the data came from the same questionnaire. Harman's (1976) one factor test checks if any factors accounted for the majority of the covariance among the variables (Podsakoff and Organ 1986). Regressions were done against all factors and confirmed that there are significant linear relationships between all paths expected in the theoretical model further supporting estimating using the structural equations modelling technique.

c) Structural Equations Modelling

Once the EFA and CFA confirm the factors and scale reliability, structural equations modelling (SEM) tests the structural theory. SEM is often based upon a phenomenon or assumptions which enables a hypothesised model to be tested in a simultaneous analysis of the entire system, subject to the goodness of fit indexes the model can argue for the 'plausibility of postulated relations among variables' (Bryne 2010; p.3). Statistical differences were then computed between groups to assess if one group influences the model more than another. The differences between models and factors can be achieved through group difference Z tests and comparing squared multiple correlations. These statistics are similar statistic to R square value that state even small R square effect can be important (Rosnow and Rosenthal 1989) and acknowledge that values of 0.20 or above are regarded adequate to explain variance (Hair *et al.* 1995), with the greater the value providing more robust evaluations of the model. Structural equation modelling has been recommended as an approach to examine the effects of coping responses upon attitude and intentional responses.

Tests of Model Fit

Marsh *et al.* (2004) noted that fit indices have evolved into pseudo hypothesis tests. Although designed to assess the degree of fit to the data (Barrett 2007), the fit indices used depends on the researcher's discretion (Hu and Bentler 1999; MacCallum, Browne and Sugawara 1996) as there is no agreed best model fit index (Iacobucci 2010). The model fit indices must be taken with caution and not over emphasised as all the aspects of the model need to be assessed in judgement, factor loading, modification indices, Chi Square and GFI's. Although the variety of indices, there is

agreement to report the $\chi 2$ (and its degrees of freedom and p-value), Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), Tucker- Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) throughout the literature (Iacobucci 2010). The $\chi 2$ is the only inferential statistic that acknowledges significance levels among the model fit indices as the other tests exist as 'rules-of-thumb' being descriptive measures (Iacobucci 2010). Kline (2011) suggested that a model demonstrates reasonable fit if the $\chi 2$ statistic adjusted by its degrees of freedom does not exceed 3.0 ($\chi 2$ / df$\leq$3). It is frequently noted that, values of model fit indices exceeding 0.90 reflect reasonable model–data fit with Hu and Bentler (1998) demonstrating strong performance (power and robustness) of the CFI with it being the index of choice (Bentler 1990). Values representing a well-fitting model are regarded as; GFI >.90, CFI >.90, RMSEA < .06, TLI > .95, and RMR/SRMR < .10/.08 (Bentler 1992; Hu and Bentler 1998; Hu and Bentler 1999), although more demanding cut off values have been proposed that appear to be largely unobtainable in appropriate practice (Marsh, Hau and Wen 2004) showing the need for a holistic view of the model. The indices provide a model fit statement ranging from greater than 0.90 being excellent, to 0.75 being very good, onto good, satisfactory and poor.

Statistical Tests

Alongside factor analysis, inferential statistical analysis techniques are used through-out the pre-tests, pilot tests and final study using SPSS (v.20). Analysis of variance techniques are used to assess the difference between means and to assess the difference between respondents responses classified as high or low response groups with correlations calculated to assess the relationships between the variables

acknowledging correlational relationships that were greater than r=0.50 to be large based on standard estimates of correlation effect sizes (Cohen 1992). Throughout the results the level of significance is classified when significant at the 0.01 level representing **, then significant at the 0.05 level with * and when significant at the less the 0.10 level classified with $^{.10}$. Mediation analysis in prevention studies is important because the processes that lead to behaviour change can be delineated (MacKinnon 1994), a mediator is an intervening variable (risk/protective factor) that explains (or influences) the desired outcome (Baron and Kenny 1986). Mediation analysis most often guided by the procedures outlined by Baron and Kenny (1986) with the majority of mediation analysis in the psychology research using their procedure making it one of the frequently cited although there are more statistically rigorous methods to assess mediation hypothesis (Preacher and Hayes 2004). Although proposed by Baron and Kenny (1986) the Sobel test (1982) is rarely used in practice (MacKinnon *et al.* 2002) as the method described by Baron and Kenny (1986) suffers from a low statistical power (MacKinnon *et al.* 2002). The alternative approach of bootstrapping the sample is a non-parametric approach to effect size estimation and hypothesis testing that does not make assumptions about the shape of distribution of the variables or the sampling distribution of the statistic (Efron and Tibshirani 1993; Mooney and Duval 1993), providing support to use confidence intervals when assessing the indirect effect of the mediator as formal significance tests of indirect effects are rarely conducted. Although the terms mediated and indirect effects are used interchangeably they are distinctly different as a mediated effect is usually thought of as the special case of indirect effects when there is only one intervening variable (Preacher and Hayes 2008). In order to tests the mediation Preacher and Hayes (2008) 'indirect macro' estimated through SPSS (v.20.0).

4.6 Preliminary studies, manipulation check and iterations

The developed scales included additional items to the established scales and iteratively updated items and question phrasing for the 11-14 year olds. The iterations throughout the studies are explained in Table 4.1 showing a brief overview from each study.

Table 4.1 Preliminary Research iterations

Study	Objective
Study 1	
Exploratory Study *N*=60 (2 Schools)	Explored the questionnaire administration tools, initial scale development and stimuli exposure.
Study 2	
Exploratory Study *N*=164 (1 School)	Explored the threat classification, scale development and initial emotional response factors.
Study 3	
Validation Study *N*=398 (4 Schools)	Confirmation of the threat classifications, scale amendments and emotional response factors.
Study 4	
Validation Study *N*=362 (1 School)	Confirmation of the control condition, scale amendments and final stimuli selection.
Study 5	
Validation Study *N*=512 (5 schools)	Confirmation of scale reliability, stimuli classification, emotional response factors and coping response.
Final Study	
Experimental Study *N*=1837 (15 Schools)	Randomly assigned to 1 of 5 conditions and responses to modified questionnaire captured.

Table 4.2 shows the demographic information for the tests alongside smoking rates.

Table 4.2 Demographic results from the preliminary tests

Study	Sample	Age	Gender (m/f)	Smoked	Friends Smoke	Home Smokers
1	60	12.3	44%/ 56%	19%	29%	50%
2	164	11.2	0/100%	2%	21%	5%
3	398	12.1	50%/50%	25%	36%	43%
4	362	11.4	60%/40%	10%	18%	57%
5	512	12.1	54%/ 46%	18%	19%	50%

The preliminary studies show that an average of 15% of 11-12 year old pupils had experimented with smoking and that around ¼ of their friends smoke with over 4 out of 5 pupils living with a smoker showing the importance of investigating social influence upon smoking rates. Considering previous research studies stated no gender differences in smoking rates, the research does not assess between gender smoking rates. The scales used to measure social influence, smoking attitude, intent, while message processing and coping response were adapted throughout the studies in Table 4.3 that provided replicable reliable scales for the factors in the conceptual model.

Table 4.3 Scale Cronbach Alphas iterations for the preliminary studies

Scale	Study 1	#	Study 2	#	Study 3	#	Study 4	#	Study5	#
SI	.939	5	.848	5	.949	5	.866	5	.932	5
SA	.674	5	.506	8	.723	8	.635	3	.707	4
Aad	.897	8	.874	8	.887	8	.833	8	.860	8
PV			.744	6	.893	6	.804	6	.855	6
PT			.757	5	.844	5	.802	5	.791	3
PE			.727	5	.776	5	.687	5	.737	5
FSI (NS)			.690	2	.867	4	.846	4	.888	3
FSA					.657	4	.709	3	.696	3
FSIQ(S)					.839	4	.887	3	.867	3

The manipulation checks were tested throughout to ensure the correct stimuli classification. The different stimuli are illustrated in Appendix A.4 showing the iterations. The perceived type of threat manipulation check is expressed in Table 4.4 which shows the Analysis of Variance (ANOVA) differences between threat classification and the ANOVA LSD test between the individual threat stimuli providing manipulation checks confirming the type of threat classification.

Table 4.4 Perceived type of threat ANOVA results

Study	Social Threat	Physical Threat
2	F(1, 144)=17.24, p<.001** (w)	F(1,108)=74.30, p<.001**(w)
2	F(5, 155)=4.30, p=.001**	F(5, 65)=23.09, p<.001**(w)
3	F(1,370)=49.62**, p<.001 (w)	F(1,394)=79.47**, p<.001 (w)
3	F(5,178)=15.09**, p<.001 (w)	F(5,181)=16.53**p<.001 (w)
4	F(2, 359)= 9.31**, p<.001	F(2,359)=17.71**, p<.001
4	F(6,355)=3.86**, p=.001	F(6,355)=6.14**, p<.001
5	F(2,158)=30.208**, <.001(w)	F(2,157)=32.568**, p<.001(w)

The differences between threat classification and the type of emotional response is shown in Table 4.5 showing that the physical emotional response is consistently different between threat types, being greater for physical threat. The social emotional response is elicited from both threats showing the emotion is universal to both threats.

Table 4.5 Elicited emotional response between threats ANOVA results

Study	Social Emotional Response	Physical Emotional Response
1	F(1,57)=0.431, p=.514	F(1,57)=5.925*, p=.018
1	F(3,55)=.344, p=.794	F(3,30)=3.03*, p=.045(w)
2	F(1, 157)=1.112, p=.293	F(1, 157)=14.33**, p<.001
2	F(5, 153)=1.26, p=.283	F(5, 153)=3.21*, p=.009
3 (NS)	F(1,298)=3.634$^{.10}$, p=.058	F(1,298)=19.90**, p<.001
3 (S)	F(1,96)=1.00, p=.320	F(1,96) =9.37, p=.003
3 (NS)	F(5,294)=2.45*, p=.034	F(5,294)=5.08**, p<.001
3 (S)	F(5, 92)=.366, p=.871	F(5,92)=2.20$^{.10}$, p=.061
5	F(2,509)=2.106, p=.123	F(2,509)=28.066**p<.001

The importance of monitoring parental view on smoking was shown to consistently influence a greater smoking intent and smoking attitude throughout the preliminary studies, with significant positive correlations shown in Table 4.6 highlighting the need to include parental view in the conceptual model as a predictor to onset of smoking behaviour alongside the additional susceptibility to peer pressure factor introduced.

Table 4.6 Social influence upon smoking intent and attitude

Study	Smoking Intent	Smoking Attitude
1 (All PV)	r(59)=-.263*, p=.034	r(59)=-.164
2 (All PV)	r(164)=.248**, p=.001	r(164)=.177*, p=.024
3 (NS PV)	r(300)=.396**, p<.001	r(300)=.279**, p<.001
3 (S PV)	r(98)=.651**, p<.001	r(98)=.659**, p<.001

4.7 Summary

This chapter outlines the philosophical background to the research, the experiment design, the sampling method and the research instrument. A discussion of data analysis techniques is described showing how factor analysis provides reliable checks for model development. This is followed by the preliminary tests that provided manipulation checks to ensure the stimuli were accurately classified and the scales reliable for the adolescent segment. Some initial results are provided which support the discussion providing replicable results to the final study conclusions. The next chapter consists of the final results from the large data collection to prove the six research propositions.

Chapter Five

Data Analysis and Results

5.1 Introduction

This chapter describes the results from the main research data collection. The results are split into three sections that systematically answer the six propositions in two stages of analysis, namely the construct validations based on factor analysis and modelling techniques and then the rigorous statistical tests. Initially the total sample is analysed which provides the conceptual model including the social influence factors *(Proposition #5)* and the difference between non-smoker and smoker responses *(Proposition #1).* This is followed by the independent non-smoker and then smoker analysis sections which initially highlight the conceptual models including social influence factors *(Proposition #5).* The difference between the type of threat *(Proposition #2)*, the role of perceived level of threat *(Proposition #3)* and how the coping response classification regulates responses *(Proposition #4)* is then provided. Each section is concluded with the influence of physical and social emotion upon responses *(Proposition #6)* with reflection of the relationship with coping response. The chapter is concluded with a summary of the propositions exploratory hypothesis.

5.2 Data Analysis for the full sample

The full sample was analysed to show how the adolescent sample aged 11-13 years old, regardless of smoking behaviour, respond to different threat appeals. This illustrates the representative mix of behaviours expected in a school population and provides initial evidence how non-smoking and smoking adolescent samples respond

to different threat appeals. Table 5.1 shows the distribution of characteristics of the whole sample.

Table 5.1 Total sample characteristic statistics

No#	Av Age	Yr 7	Yr 8	C Sch	G Sch	Male	Female	NS	S
1837	11.92	51.2%	48.8%	67.5%	32.5%	31.6%	68.4%	1479	356

See appendix B.1.1 for the full school frequency table.

Full Sample Factor Analysis

The factor analysis was conducted in two phases as described in Chapter Four. The Exploratory Factor Analysis (EFA) was initially conducted with a proportion of the whole sample *(n=460)* which was followed by the Confirmatory Factor Analysis (CFA) with the remainder *(n=1377).* The structural equations model was then estimated on the full sample of adolescents *(n=1837)* applying the amendments to the scales and factors to provide a reliable model fit and reliable factors for further structural equation modelling analysis.

a) Exploratory Factor Analysis

The initial exploratory factor analysis was conducted with 450 adolescents. This was reported using measures of sampling adequacy and also convergent, discriminant and reliability tests. The sample was adequate for factor analysis based on the interpretation of the Kaiser-Meyer-Olkin statistic being high (KMO=.935). The Bartlett Test of Sphericity was also significant confirming the 11 factors ($p<.001$; Chi-Square=48916.422/ df=1081) that accounted for 60.61% of the total variance based on the eigenvalues criteria being close or above 1.00. Using the thresholds

highlighted in sub-section 4.5, the exploratory factor analysis pattern matrix showed there were no cross loadings between factors, and had factors loadings greater than the 0.3 threshold. Table 5.2 shows that the Cronbach Alpha's (α's) were all acceptable above the 0.7 threshold. The Composite Reliabilities (CR) was reliable being above the 0.7 threshold and the Average Variance Explained (AVE) satisfactory, being close or above the 0.5 threshold. The factors that were close to the threshold were verified to be significantly different and not convergent based on the squared correlation test. The factor correlation matrix had no convergences, and regression tests confirmed that there were significant linear relationships between all paths expected in the model; see appendices B.1.2- B.1.3 for the pattern matrix, discriminant reliability tests and the full correlation matrix.

Table 5.2 Reliability Tests

Factor	SPP	PV	SM	SI	SA	PE	PT	FSA	MD	AAD	ATAD
α's	.827	.830	.810	.918	.793	.859	.929	.746	.761	.846	.865
CR	.759	.840	.815	.943	.744	.845	.927	.755	.766	.821	.862
AVE	.537	.569	.602	.770	.429	.489	.617	.520	.523	.536	.611

b) Confirmatory Factor Analysis

The confirmatory factor analysis was estimated with the remaining 1377 adolescents. The factor loadings and model fit are reported followed by the convergent, discriminant and reliability tests. The confirmatory factor analysis shows that after theoretical consideration and removing the largest modification indices while retaining a representative amount of items per factor, the model had acceptable model

fit across the indicators described in Table 5.3. The 11 factors accounted for 70.99% of the total variance expressed in Factor Path Diagram illustrated in Figure 5.1 showing that the factor loadings were all reliable.

Figure 5.1 Factor Path Diagram

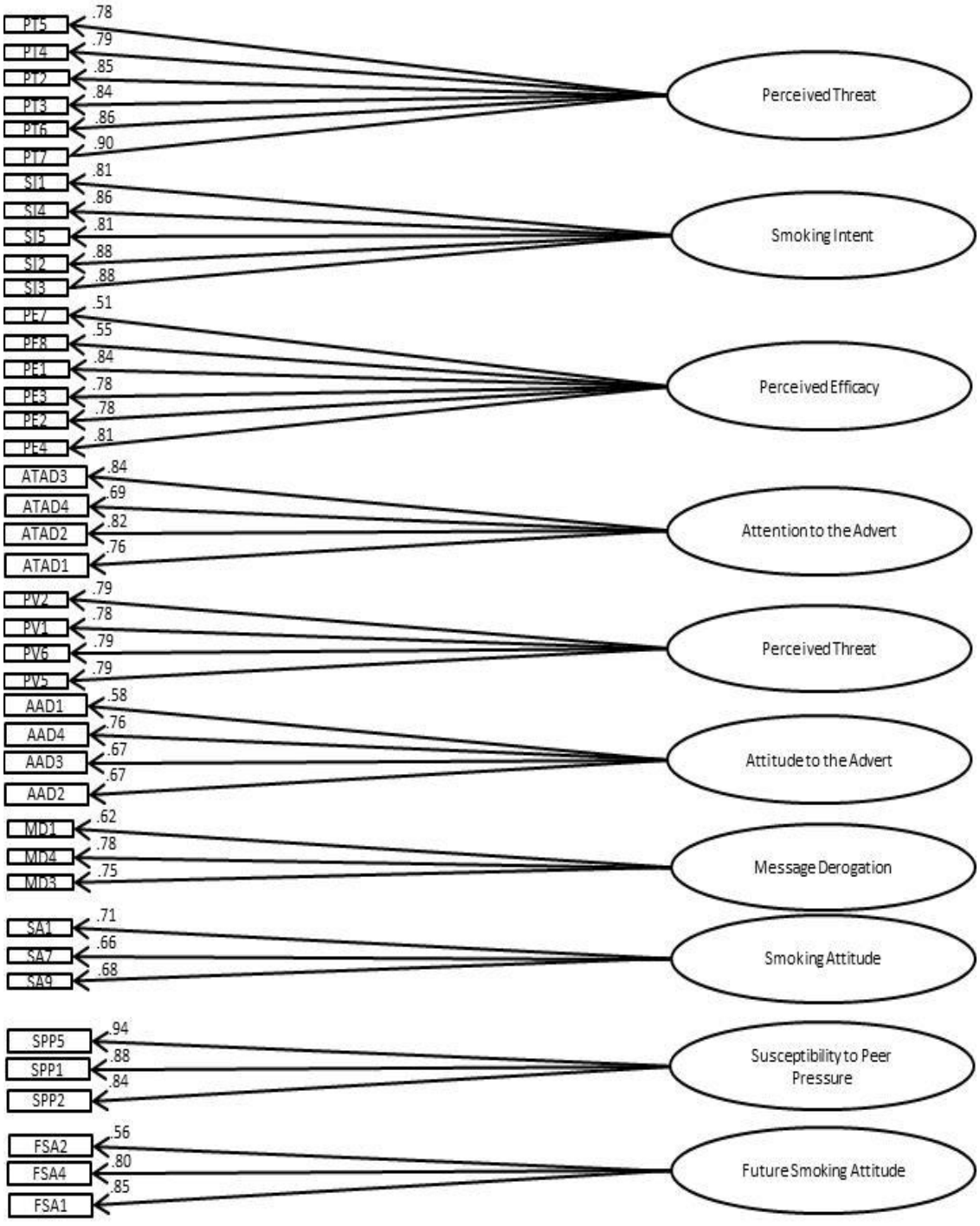


Table 5.3 Model Fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
2.650	.950	.972	.969	.0829	.030

Using the same thresholds highlighted in sub-sections 4.5 and 5.2.1 (a), Table 5.4 shows that the Cronbach Alpha (α's) scores were acceptable. The Composite Reliability (CR) were reliable and the Average Variance Explained (AVE) acceptable. The factor correlation matrix had no convergences the regression tests and confirmed that there were significant linear relationships between all paths expected in the structural equation model. In addition, the discriminant validity tests also showed that the factors were statistically valid to be included; see appendices B.1.4-B.1.5 for full tests including discriminant reliability and the factor correlation table.

Table 5.4 Reliability tests

Factor	PT	SI	PE	ATAD	PV	AAD	SM	MD	FSA	SPP	SA
α's	.932	.919	.859	.865	.830	.846	.810	.761	.746	.827	.756
CR	.944	.939	.891	.903	.887	.881	.886	.862	.848	.852	.808
AVE	.739	.757	.581	.700	.663	.650	.722	.676	.651	.666	.588

c) Emotional response confirmatory factor analysis

The confirmatory factor analysis showed that the emotions were factored on two components. Although the items accounted for 70.67% of the variance by two factors, the pattern matrix showed that the emotion anger loaded on both factors; see appendix

B.1.6 for full matrix. In order to overcome the cross loading, the emotion anger was removed from this confirmatory factor analysis. The remaining six emotions were classified into two factors with each item loading highly on each factor. The two factors account for 73.90% of the total variance explained providing a reliable KMO statistic of 0.827. The component correlation matrix shows the factors correlated, with value 0.524 which accounted for 27% of the total variance. This demonstrates that disgust, fear and sadness represent one physical emotional response factor, whereas shame, guilt and embarrassment represent a separate factor of a social emotional response.

Full Sample analysis

The factor analysis confirmed the factors to be used in the structural equation model and further analysis which was conducted with the entire sample of adolescents (*n=1837*). The Cronbach Alpha (α's) in Table 5.5 show the scales were acceptable for the whole sample.

Table 5.5 Cronbach α's results

Factor	**SI**	**SA**	**SPP**	**PV**	**PE**	**PT**	**FSA**	**ATAD**	**AAD**	**MD**
α's	.919	.756	.827	.830	.859	.932	.746	.865	.846	.761

The analysis is segmented by the propositions initially reviewing the conceptual model and the role of social influence upon smoking behaviour. The difference between non-smoker and smoker samples were investigated regarding post exposure responses. This is followed by the analysis on each threat type between non-smoker and smoker samples.

a) Role of threat categories on responses

To illustrate the differences between non-smokers' and smokers' responses, the post-exposure responses towards each threat were assessed. The observations per threat were 39.8% social threat (*n*=731), 41.3% physical threats (*n=758*) and 8.9% non-threat condition (*n=348*). The T-test between post exposure behaviour and the median value (median=3) for each post behavioural response per threat are described in Table 5.6 which proves that all results were significantly different from the median for each threat and each sample.

Table 5.6 T-test between mean smoking response and median smoking response

Sample	**FSA t-test**	**FSA**(m:sd)	**FSI(Q)t-test**	**FSI(Q)**
NS(STr)	t(581)=48.549**,p<.001	1.561;0.775	t(581)=46.969**,p<.001	1.503;0.771
NS(PTr)	t(609)=48.665**,p<.001	1.503;0.763	t(609)=44.561**,p<.001	1.477;0.819
NS(NTr)	t(287)=33.574**,p<.001	1.490;0.753	t(287)=30.487**,p<.001	1.474;0.821
S (STr)	t(149)=30.699**,p<.001	2.287;0.913	t(149)=46.699**,p<.001	4.040;1.060
S (PTr)	t(148)=30.158**,p<.001	2.235;0.902	t(148)=38.425**,p<.001	3.864;1.223
S (NTr)	t(59)=18.564**, p<.001	2.161;0.902	t(59)=30.117**, p<.001	4.089;1.052

b) Relationship between Smoking Attitude and Future Smoking Attitude

The relationship between pre exposure self-reported smoking response and post exposure self-reported smoking response is described in Table 5.7 which shows that although future smoking attitude is estimated by smoking attitude, there were no differences between threats showing that threat alone does not influence any

differences in behaviour. This observation provides the basis to run the analysis between non-smokers and smokers to enquire what aspects influence behaviours and responses.

Table 5.7 Group difference between base line and post exposure responses

Relationship	Physical threat	Social threat	Group Difference
SA→FSA	β=0.67**, p<.001	β=0.65**, p<.001	z=-0.538 (ns)

See appendix B.1.7 regression weights and squared multiple correlations tables.

c) Type of threat mediation analysis

The role that the critical value has upon behaviour is shown to mediate the relationship in Table 5.8. This shows that the critical value indirectly influences the relationship between SA and FSA when witnessing physical threats. The critical value coping response contributes to influence 0.0214 towards the future smoking attitude alongside the initial smoking behaviour. No other significant indirect mediation results were found.

Table 5.8 Behaviour and critical value mediation results

Relationship	Total effect	Direct effect	Indirect effect
SA→CV→FSA (PTr)	.5608**,p<.001	.5394**,p<.001	.0214, llci .0069 / ulci .0452
SA→CV→FSA (STr)	.4508**,p<.001	.4478**,p<.001	.0030,llci -.0145 / ulci .0252

See appendix B.1.8 for full mediation tests.

Results on Social influence on behaviour

The role that social influences have upon pre-exposure behaviour intent and attitude were analysed to test Proposition #5 that: *'Social factors will significantly influence smoking beliefs and attitudes'.*

a) Initial results for social influence correlation

The Pearson correlation summarized in Table 5.9 shows that adolescents' susceptibility to peer pressure and parental view on smoking were significantly positively correlated to smoking intent and smoking attitude. These results suggest a significant relationship between the social influence factor and the self-reported smoking attitude and smoking intent.

Table 5.9 Correlation between social factors and smoking response

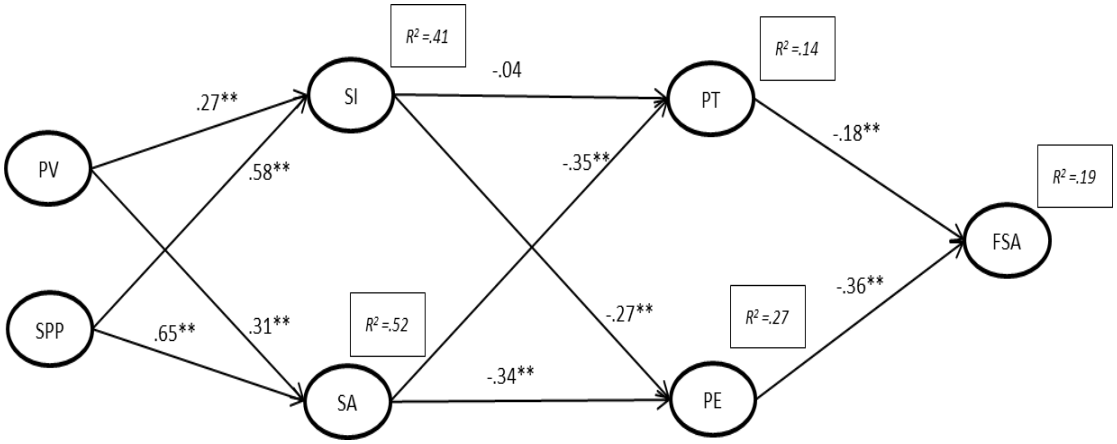
Factor	Correlation with SI	Correlation with SA
SPP	r(1837)=0.585**, p<.001	r(1837)=0.604**, p<.001
PV	r(1837)=0.381**, p<.001	r(1837)=0.365**, p<.001

b) The conceptual model

The full structural equation model was predicted to assess how it estimates adolescents' self-reported behaviour regardless of threat appeal observed. The model provides a very good fit across the indicators described in Table 5.10, estimating future smoking attitude with acceptable variance as shown in Figure 5.2 and that the

social factors significantly estimate smoking attitude and smoking intent accounting for high levels of variance for both factors.

Figure 5.2 Total sample full model



**p<.001, * p<.05

Table 5.10 Total sample full model fit indices

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
6.471	.917	.937	.929	.0829	.055

See appendix B.1.9 for regression weights and squared multiple correlations tables.

Results on the differences between non-smoking and smoking adolescents

The between group analysis was conducted to uncover the differences between the two samples and test Proposition #1 that: *'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'*

a) The full model for social and physical threats

The structural equation model was estimated between non-smoker (NS) and smoker (S) samples to assess the difference between responses. The model provides very good fit indicators as described in Table 5.11 which is also illustrated in Figure 5.3. The model estimates non-smokers' future smoking attitude with acceptable variance, with the variance doubling for the smoker sample. There were significant differences between the influential social factors and initial smoking self- reported responses shown in Table 5.12.

Figure 5.3 Full model (NS V. S)

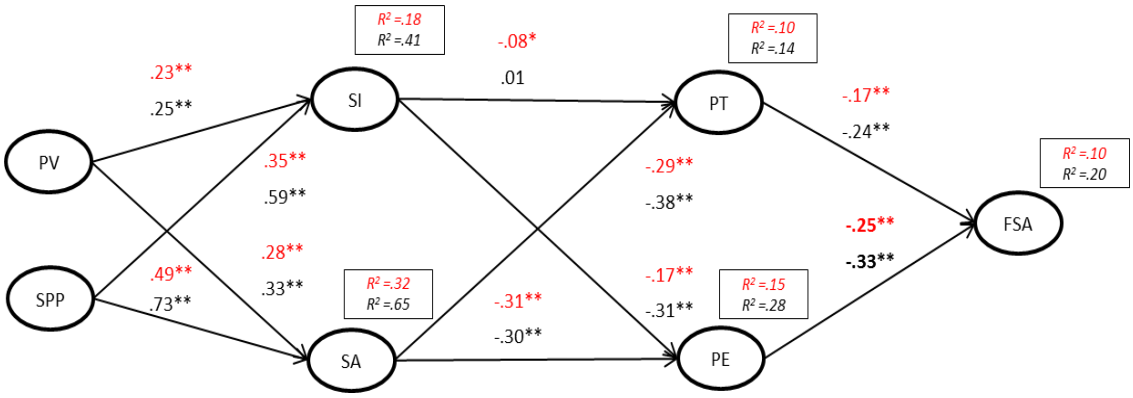


Table 5.11 Full model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
3.492	.911	.929	.920	.1059	.037

Table 5.12 Beta value and group differences for Full model

Relationship	Non Smokers	Smokers	Group Difference
PE→FSA	β=-.25*,p=.006	β=-.33**, p<.001	z=-1.68*
PT→FSA	β=-.17**, p<.001	β=.24**, p<.001	z=-0.619

See appendix B.1.10 for regression weights and squared multiple correlations tables.

b) The full model for physical threats and social threats

The model is estimated between non-smokers' and smokers' responses to physical threats (PTr) and then social threats (STr) to assess the difference between responses. Both the models provide good fit across the indicators described in Table 5.13 and both models estimate non-smokers' future smoking attitude with acceptable variance, whereas increases for the smoker sample shown in Table 5.14.

Table 5.13 Full model fit for PTr/STr

Model	CM/DF	GFI	CFI	TLI	SRMR	RMSEA
PTr	2.305	.865	.914	.903	.1119	.042
STr	2.434	.859	.900	.887	.1228	.044

Table 5.14 Beta value and group differences for full model (PTr/STr; NS V. S)

Relationship	Non-smokers	Smokers	Group Difference
PT→FSA(PTr)	β=.11*, p=.014, r^2=.10	β=.09, p=ns, r^2=.17	z=0.434 (ns)
PE→FSA(PTr)	β=.29**,p<.001, ²=.10	β=.39*,p=.005,r^2=.17	z=-1.333 (ns)
PT→FSA(STr)	β=-.17**,p<.001,r^2=.11	β=-.36**,p<.001,r^2=.31	z=-1.423 (ns)
PE→FSA(STr)	β=-.27**,p<.001,r^2=.11	β=-.35**,p<.001,r^2=.31	z=-1.077 (ns)

See appendices B.1.11-12 for regression weights and squared multiple correlations tables.

c) Behaviour differences between samples

The difference between non-smokers' and smokers' response provides sample variances regarding post exposure behaviour dependent on threat observed. Initially group differences for the pre and post exposure behaviours were assessed, followed

by the role of emotions influencing behaviours. This was followed by ANOVA analysis between samples regarding future smoking attitude and social influences. Then ANOVA are conducted for each exposure independently showing the difference between each samples emotional response, message processing factors, perceived level of threat and then coping response classification.

Pre and post attitudinal difference

The difference between pre exposure smoking response and post exposure self-reported smoking responses is described in Table 5.15. The relationship between pre exposure and post exposure value was significant for all values, with significant differences between non-smokers' and smokers' responses to only physical threats.

Table 5.15 Group difference between pre and post exposure responses

Relationship	Non-Smokers	Smokers	Group Difference
SA→FSA (PTr)	β=0.58**, p<.001	β=0.65**, p<.001	z=-2.967***
SA→FSA (STr)	β=.52** p<.001	β=.66**, p<.001	z=-1.126

See appendices B.1.13-14 for regression weights and squared multiple correlations tables.

Emotional response and post exposure attitudinal measures

The relationship between the emotional responses and post exposure self-reported smoking response is described in Table 5.16. Only the relationship between physical emotional response and future smoking attitude towards physical threats was significantly different between non-smoker and smoker samples showing a greater physical emotional response influences a reduced future smoking attitude among smokers than non-smokers.

Table 5.16 Group difference between pre and post exposure responses

Relationship	Non-Smokers	Smokers	Group Difference
SEm→FSA (STr)	β=.01, p=ns	β=.02, p=ns	z=0.150
SEm→FSA (PTr)	β=.10*, p=.037	β=-.05, p=ns	z=-1.069
PEm→FSA (STr)	β=-.06, p=ns	β=.03, p=ns	z=0.687
PEm→FSA (PTr)	β=.04, p=ns.	β=-.20*, p=.035	z=-2.230**

See appendices B.1.15-18 for regression weights and squared multiple correlations tables.

Pre-exposure behavioural response between sample

The ANOVA results between samples smoking responses are in Table 5.17 showing smokers' have significantly greater smoking attitude and smoking intent than the non-smoker sample and that smokers' have significantly different parental view on smoking, susceptibility to peer pressure, and school motivations.

Table 5.17 ANOVA smoking influential factors between NS and S responses

Factor	ANOVA	Non-Smokers	Smokers
Smoking Attitude	F(1,408)=195.703**,p<.001(w)	1.223;0.469	1.892;0.873
Smoking Intent	F(1,379)=372.889**,p<.001(w)	1.188;0.422	2.412;1.181
Parental View	F(1,454)=140.488**,p<.001(w)	1.472;0.686	2.095;0.937
Scp to Peer Pressure	F(1,409)=291.912**,p<.001(w)	1,300;0.613	2.357;1.130
School Motivation	F(1,479)=174.813**,p<.001(w)	4.390;0.669	3.774;0.817

Emotional response and message processing between samples per threat

The ANOVA results between the Physical Emotional response (PEm) and Social Emotional response (SEm) for each the type of threat and message processing items is shown between samples in Table 5.18. This explains that there were significant differences between non-smokers' and smokers' emotional responses to physical and social threats. Namely, non-smokers' had a significantly greater physical emotional response to both social threats and physical threats, and smokers' had a weakly significantly greater social emotional response to physical threats. The message processing items were significantly different between non-smokers' and smokers' irrespective of threat observed. Namely non-smokers' attitude towards the advert (AAD) and attention towards the advert (ATAD) is significantly greater than the smoker sample towards both threats, whereas smokers' message derogation (MD) is significantly greater than the non-smoker sample towards the physical threats.

Table 5.18 ANOVA between non-smokers and smokers emotional response

Factor	ANOVA	Non-Smokers	Smokers
SEm (PTr)	$F(1,756)=3.264^{.10}$, p=.071	2.797;1.076	2.976; 1.089
SEm (STr)	F(1,729)=0.884, p=.347	2.537;1.168	2.646; 1.027
SEm (NTr)	F(1,346)=0.000, p=.988	1.893;1.126	1.890; 1.108
PEm (PTr)	**F(1,756)=29.105**, p<.001**	**3.746;1.209**	**3.150;1.196**
PEm (STr)	**F(1,271)=19.222**,p<.001(w)**	**2.873;1.344**	**2.405;1.117**
PEm (NTr)	**F(1,346)=.400, p=.527**	**2.227;1.428**	**2.100;1.316**
AAD (PTr)	F(1,756)=35.862**, p<.001	3.972;0.970	3.431;1.045
AAD (STr)	F(1,256)=6.302*, p=.013 (w)	3.437;1.089	3.210;0.963
AAD (NTr)	F(1,346)=2.427, p=.120	3.012;1.362	2.712;1.332

ATAD (PTr)	**F(1,756)=3.251**, p<.001**	**3.488;1.126**	**3.303;1.088**
ATAD (STr)	**F(1,729)=6.854**, p<.001**	**3.047;1.174**	**2.770;1.072**
ATAD(NTr)	**F(1,346)=1.840$^{.10}$, p=.077**	**2.760;1.299**	**2.435;1.267**
MD (PTr)	F(1,756)=18.581**, p<.001	2.141;1.017	2.549;1.103
MD (STr)	F(1,729)=12.870**, p<.001	2.335;1.004	2.664;0.986
MD (NTr)	F(1,346)=1.840, p=.176	2.532;1.130	2.752;1.213

Perceived level of threat and coping response between samples per threat

The ANOVA results between the samples perceived level of threat (PLT) and the critical value coping response (CV) for each threat condition is reported in Table 5.19. Non-smokers' had a significantly greater perceived level of threat than smokers' to both threats, while smokers' had a significantly lower critical value than non-smokers' for all threat conditions showing signs of a maladaptive coping response.

Table 5.19 ANOVA between non-smokers and smokers perceived level of threat

Factor	ANOVA	Non-Smokers	Smokers
PLT (PTr)	F(1,756)=18.057**, p<.001	3.829;1.383	3.295;1.328
PLT (STr)	F(1,729)=5.533*, p=.019	2.986;1.376	2.695;1.252
PLT (NTr)	F(1,346)=0.056, p=.813	2.273;1.466	2.223;1.487
CV (PTr)	F(1,217)=39.998**, p<.001(w)	-0.064;0.839	-0.567;0.877
CV (STr)	F(1,225)=13.783**, p<.001(w)	-0.069;0.851	-0.368;0.889
CV (NTr)	F(1,76)=10.115*, p=.002 (w)	-0.004;0.898	-0.490;1.110

Summary of the Full Sample (smokers and non-smokers)

The analysis described in this section shows that the conceptual model estimates behaviour across the whole adolescent segment sampled and provides evidence to test Proposition #5: *'Social factors will significantly influence smoking beliefs and attitudes'.* Further analysis to test Proposition #1 that: *'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'*. It is suggested that the adolescent sample should be segmented to provide more effective health communications results due to the heterogeneity of findings. The next two sections will focus on the individual analysis on non-smoker and smoker samples.

5.3 Data Analysis for the Non-smoker sample

To recap, the non-smoker sample consists of all those people who have never tried smoking, not even one puff of a cigarette. This segment has never experimented with smoking, thus being classified in pre-contemplation stage of the behaviour change models. Table 5.20 shows the distribution of the non-smoker samples characteristics.

Table 5.20 Non-smoker characteristics

No#	Av Age	Yr 7	Yr 8	C Sch	G Sch	M	F
1479	11.88	54.5%	45.5%	61.9%	38.1%	27.7%	72.3%

See appendix B.2.1 for the full school frequency table.

Non-Smoker Factor Analysis

The factor analysis was conducted in two phases as described in Chapter Four, initially the exploratory factor analysis was conducted with a proportion of the non-smoker sample *(n=361)* which was followed by the confirmatory factor analysis with the remainder *(n=1117)*. Then the structural equations model was estimated on the total non-smoker data set *(n=1479)* applying the amendments from the factor analysis on the scales and factors to provide a reliable model fit and reliable factors for further structural equation modelling analysis.

a) Exploratory Factor Analysis

The initial exploratory factor analysis was conducted with 361 non-smoking adolescents. This was reported using measures of sampling adequacy and also convergent, discriminant and reliability tests. The sample was adequate for factor analysis based on the interpretation of the Kaiser-Meyer-Olkin statistic being high (KMO=.876). The Bartlett Test of Sphericity confirmed the 8 factors ($p<.001$; Chi-Square=6791.21/ df=561) accounted for 58.89% of the total variance based on the eigenvalues criteria. Using the thresholds highlighted in sub-sections 4.5 and 5.2.1 (a) the exploratory factor analysis pattern matrix showed there are no cross loadings between factors, and all factors had acceptable loadings. Table 5.21 shows that Cronbach Alphas (α's) were acceptable, the Composite Reliability (CR) were reliable and the Average Variance Explained (AVE) satisfactory. The factors that were close to the threshold were verified to be significantly different and not convergent based on the squared correlation test. The factor correlation matrix had no convergences, and regression tests confirmed that there were significant linear relationships between

all paths expected in the model; see appendices B.2.2-3 for the pattern matrix, discriminant reliability tests and the full factor correlation matrix.

Table 5.21 Reliability tests

Factor	PT	PE	FSI	PV	SI	SA	SPP	FSA
α	.938	.901	.825	.822	.799	.719	.674	.677
CR	.937	.861	.833	.831	.812	.778	.667	.686
AVE	.650	.564	.555	.553	.521	.469	.428	.461

b) Confirmatory Factor Analysis

The confirmatory factor analysis was run with the remaining 1117 non-smoking adolescents. The factor loadings and model fit are reported followed by the convergent, discriminant and reliability tests. The confirmatory factor analysis shows that after theoretical consideration and removing the largest modification indices while retaining a representative amount of items per factor, the model had a good fit across the indicators described in Table 5.22. 8 factors accounted for 68.80% of the total variance are expressed in Factor Path Diagram illustrated in Figure 5.4 showing that the factor loadings are all reliable.

Figure 5.4 Factor Path Diagram

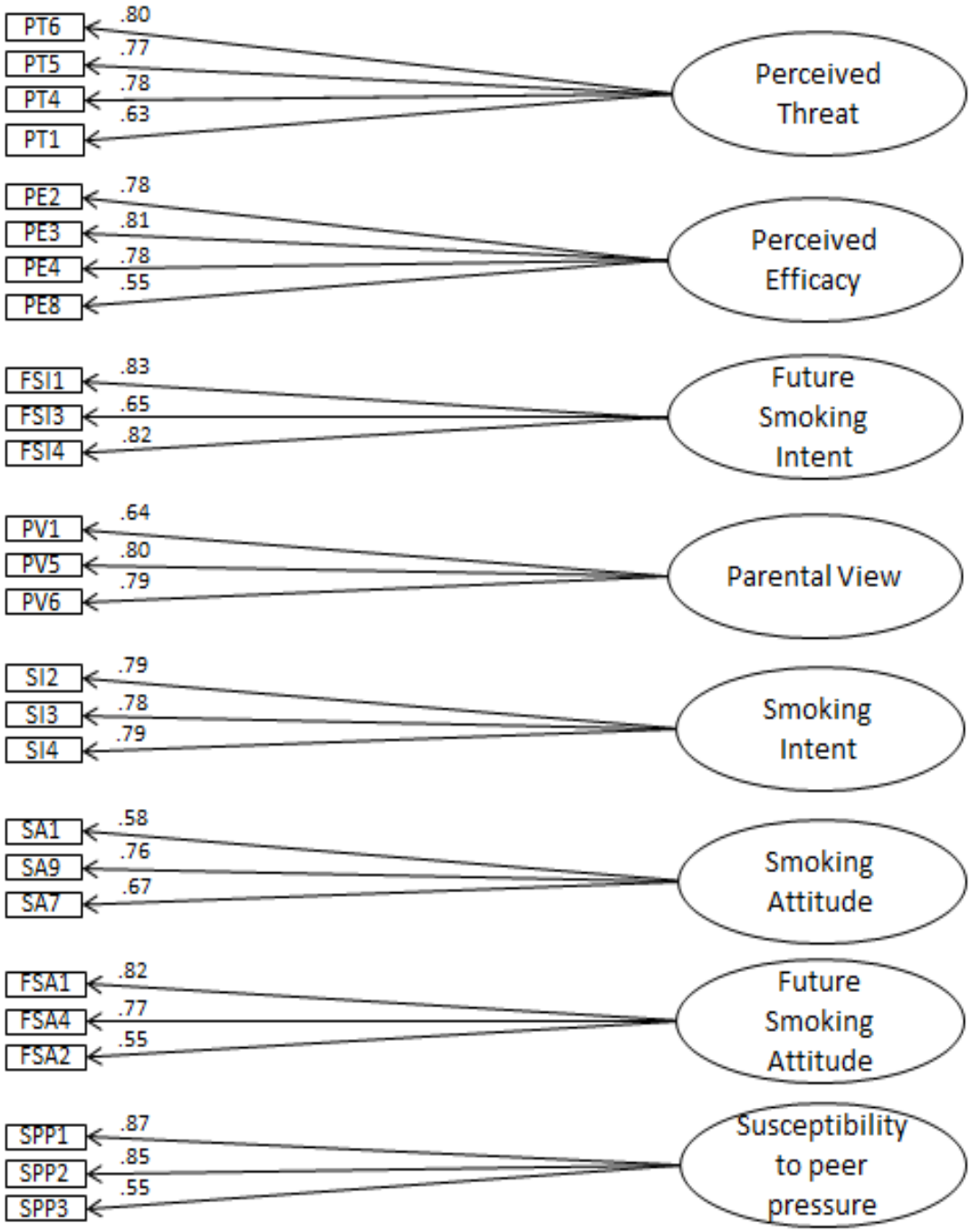


Table 5.22 Model Fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
2.435	.956	.966	.959	.0362	.036

Using the same thresholds highlighted in sub-sections 4.5 and 5.2.1 (a), Table 5.23 shows that the Cronbach Alpha (α's) scores were acceptable. The Composite Reliability (CR) was reliable and the Average Variance Explained (AVE) satisfactory. The one factor close to the threshold was verified to be significantly different and not convergent using the squared correlation discriminant reliability test. The factor correlation matrix had no convergences, the regression tests confirmed that there are significant linear relationships between all paths expected in the structural equation model. In addition, the discriminant validity tests also showed that the factors were statistically valid to be included; see appendices B.2.4-5 for full tests including discriminant reliability and the factor correlation table.

Table 5.23 Reliability tests

Factor	PT	PE	FSI	PV	SI	SA	SPP	FSA
α	**.**828	**.**806	**.**785	**.**786	.829	.700	.791	.711
CR	.834	.823	.812	.792	.830	.715	.808	.764
AVE	**.**558	.542	.593	.561	.619	.458	.593	.526

Non-Smoker sample analysis

The factor analysis confirmed the factors to be used in the structural equation model and further analysis which was conducted with the entire sample of non-smokers (*n=1479*). The Cronbach Alpha (α's) in Table 5.24 show the scales are acceptable.

Table 5.24 Cronbach α's results

Factor	SI	SA	SPP	PV	PE	PT	FSA	FSI
α	.810	.705	.769	.798	.812	.837	.703	.810

The analysis is structured by the propositions, initially reviewing the conceptual model and the role of social influence upon smoking behaviour. The difference between responses to threat appeal is reviewed followed by the perceived level of threat. To conclude the difference between the critical value classifications was assessed followed by the role of the two clusters of emotional responses.

Non-smoker results on Social influence on behaviour

The role that social influences have upon pre-exposure behaviour intent and attitude were analysed to test Proposition #5 that: *'Social factors will significantly influence smoking beliefs and attitudes'.*

a) Initial Non-Smoker results for social influence correlation

The Pearson correlation summarized Table 5.25 shows that non-smokers' susceptibility to peer pressure and parental view on smoking were significantly positively correlated to smoking intent and smoking attitude. These results suggest a significant relationship between the social influence factor and the self-reported smoking attitude and smoking intent.

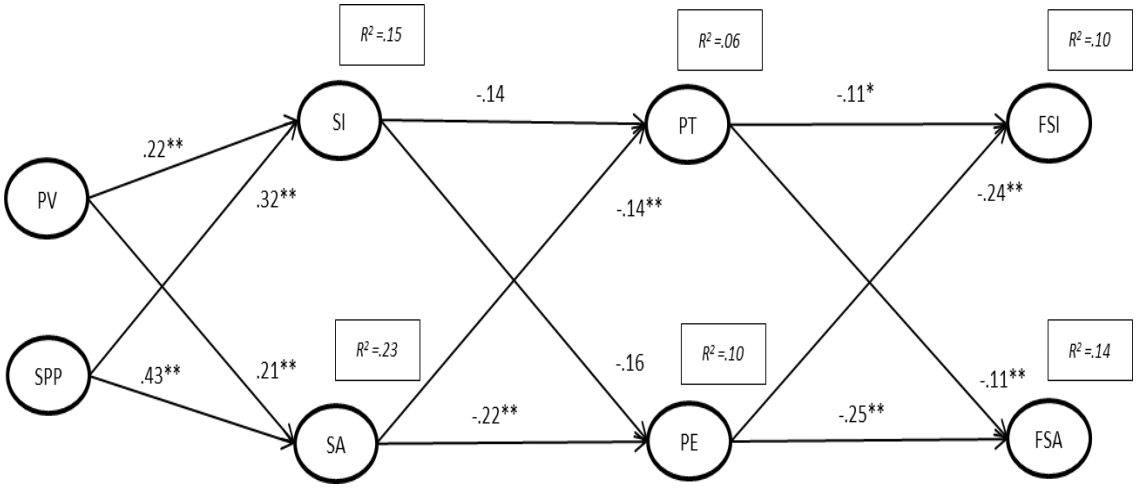
Table 5.25 Correlation between social factors and smoking response

Factor	Correlation with Smoking Intent	Correlation with Smoking Attitude
SPP	r(1479)=0.299**, p<.001	r(1479)=0.377**, p<.001
PV	r(1479)=0.218**, p<.001	r(1479)=0.213**, p<.001

b) Full non-smoker conceptual model

The full structural equation model was predicted to assess how it estimates non-smoker self-reported behaviour regardless of the classification of threat appeal observed. The model provides excellent fit across the indicators as described in Table 5.26 estimating future smoking attitude and future smoking intent with acceptable variance as shown in Figure 5.5. The social factors significantly estimate smoking attitude and smoking intent accounting for high levels of variance for both factors.

Figure 5.5 Non-smoker full model



**p<.001, * p<.05

Table 5.26 Non-smoker full model fit indices

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
4.497	.937	.933	.923	.049	.049

See appendix B.2.6 for regression weights and squared multiple correlations tables.

Non-smoker results on post-exposure responses between threat categories

The post-exposure response towards each threat was assessed, the observations per threat were 41.2% social threat (*n*=610), 39.3% physical threats (*n*=581) and 19.5% non-threat condition (*n*=288), responses were analysed against each other to understand the differences between threats and test Proposition #2 that: *'Post exposure behavioural responses will be significantly different between threats'*. The results are split into sections; initially the post-exposure behavioural responses are described using the structural equations model. This is followed by the difference between responses to threats is provided.

a) Non-smoker full model for social and physical threats

The structural equation model was estimated to assess the differences between threat classifications for the non-smoker sample. The model provides very good fit across the indictors described in Table 5.27 which is also illustrated in Figure 5.6. The model estimates post exposure smoking attitude and intention behaviours towards both threats with differing levels of variance, being greater for physical threats. Table 5.28 shows the significant differences between threats for the relationship between perceived efficacy and smoking intent and smoking attitude.

Figure 5.6 Non-smoker full model (Physical Threat V. Social Threat)

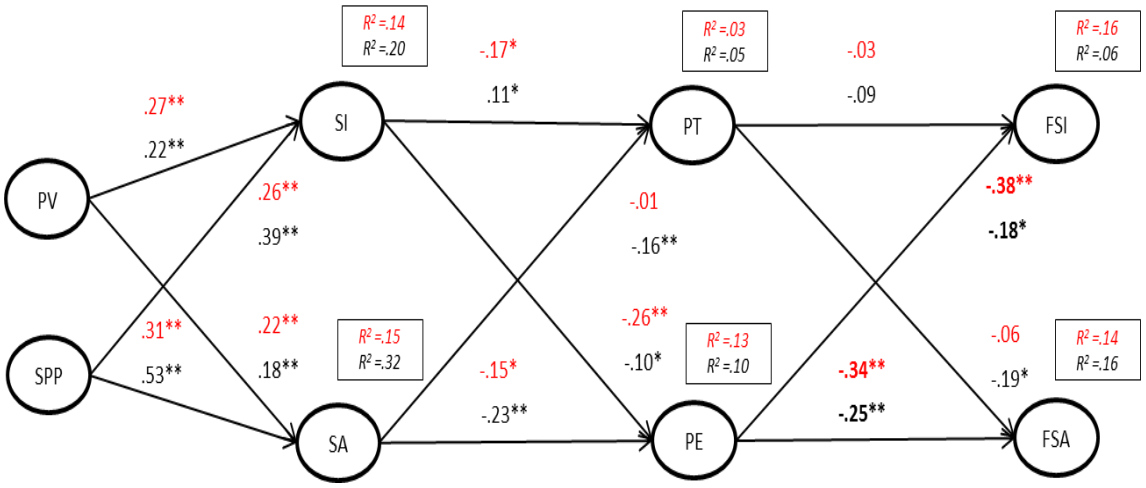


Table 5.27 Non-smoker full model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
2.746	.909	.921	.909	.096	.038

Table 5.28 Beta value and group differences for Non-smoker full model

Relationship	Social threat	Physical threat	Group Difference
PT→FSA	β=-.19*,p=.006	β=.06, p=ns	z=-1.098 (ns)
PT→FSI	β=.09, p=ns	β=.03, p=ns	z=-0.436 (ns)
PE→FSA	β=.18*, p=.007	β=.38**, p<.001	z=1.768*
PE→FSI	β=-.25**,p<.001	β=-.34**,p<.001	z=3.419***

See appendix B.2.7 for regression weights and squared multiple correlations tables.

b) Behaviour differences between threats

The difference between pre and post exposure behaviour is described between threats which is followed by the ANOVA results between responses to the threats for behaviours, emotional responses, message processing and perceived level of threat.

Pre and post attitudinal difference

The difference between base line self-reported smoking response and post exposure self-reported smoking response between threats is described in Table 5.29. Only the relationship between smoking attitude pre exposure and future smoking attitude post exposure was significantly different between threat conditions. This shows that future smoking attitude was influenced more by threat classification than future smoking intentions.

Table 5.29 Group difference between base line and post exposure responses

Relationship	Physical threat	Social threat	Group Difference
SA→FSA	β=.58**, p<.001.	β=.52**, p<.001	z=-2.273**
SI→FSI	β=.51**, p<.001.	β=.51**, p<.001	z=-1.009 (ns)

See appendices B.2.8-9 regression weights and squared multiple correlations tables.

Post-exposure behavioural response between threat categories

The influence of the type of threat on future smoking attitude and future smoking intent is described in Table 5.30. Post exposure behaviour responses were not significantly different between threat conditions.

Table 5.30 Non Smoker ANOVA post exposure behaviour between conditions

Factor	ANOVA	Social Threat	Physical Threat	Non Threat
FSA	F(2,1476)=1.198,p=.302	1.561;0.775	1.503;0.763	1.490;0.753
FSI	F(2,1476)=0.203,p=.818	1.503;0.771	1.477;0.818	1.474;0.821

Post exposure emotions and message processing response between threat categories

The influence of the type of threat on the post exposure physical emotional response (PEm) and the social emotional response (SEm), alongside message processing factors is described in Table 5.31. The emotional responses were significantly different between threat conditions, with the physical emotional response being significantly greater towards physical threats than social threats, while the social emotional response was significantly greater towards social threats than physical threats. The message processing items were significantly influenced by the type of threat, with the ATAD being significantly greater towards physical threats than social threats, whereas the MD was significantly greater towards the physical threats than social threat. The perceived level of threat was significantly different between threat conditions being significantly greater towards physical threats than social threat.

Table 5.31 Non Smoker ANOVA post exposure responses between threat conditions

Factor	ANOVA	Social Threat	Physical Threat	Non Threat
PEm	F(2,740)=145.996**,p<.001(w)	2.873;1.344	3.746;1.209	2.226;1.428
SEm	F(2,810)=30.639**, p<.001 (w)	2.395;1.291	2.248;1.316	1.742;1.127
AAD	F(2, 707)= 76.147**,p<.001(w)	3.436;1.089	3.972;.970	3.012;1.362
ATAD	F(2,740)=41.357**, p<.001 (w)	3.047;1.174	3.488;1,126	2.760;1.299
MD	F(2, 1476)= 14.717**, p<.000	2.335;1.004	2.141;1.017	2.531;1.130
PLT	F(2,1476)=132.086**, p<.001	2.986;1.376	3.829;1.383	2.272;1.466

See appendix B.2.10 for full post hoc LSD tests.

Non Smoker results on perceived level of threat and behavioural measures

The influence that the perceived level of threat has on post exposure responses was analysed to test Proposition #3 that: *'The perceived level of threat will significantly influence post exposure responses to each threat condition'*. Initially the level of threat was correlated with the post exposure behaviour items, which was followed by ANOVA tests between the high and low perceived levels of threat categories. Perceived level of threat significantly influences different post exposure behaviour responses shown in Table 5.32 and 5.33. Although the FSI was significantly negatively correlated to the level of threat for physical threats and social threats, only the FSI towards physical threats was significantly different between perceived levels of threat categories, being significantly lower for those with a high perceived level of threat towards the advert. The FSA was weakly significantly negatively correlated to the level of threat for physical threats with the FSA being significantly different between low and high perceived level of threat categories, namely being significantly lower for those with a high perceived level of threat towards the advert.

Table 5.32 Non Smoker perceived level of threat classification differences

Factor	Correlation with LT	Factor	Correlation with LT
FSI(PTr)	r(610)=-0.179**,p<.001	FSA(PTr)	r(610)=-0.079$^{.10}$,p=.051
FSI(STr)	r(581)=-0.079$^{.10}$,p=.056	FSA(STr)	r(581)=-0.035, p=.395
FSI(NTr)	r(288)=-0.014,p=.812	FSA(NTr)	r(288)=-0.022, p=.712

Table 5.33 Non Smoker perceived level of threat classification differences

Factor	ANOVA	Low LT	High LT
FSI(PTr)	F(1,246)=11.939**,p=.001	1.683;1.001	1.394;0.716
FSI(STr)	F(1,575)=2.090,p=.149	1.544;0.814	1.452;0.714
FSI(NTr)	F(1,286)=0.087,p=.769	1.483;0.843	1.145;0.759
FSA(PTr)	$F(1,285)=3.519^{.10}$, p=.062	1.600;0.833	1.464;0.730
FSA(STr)	F(1,579)=0.877, p=.349	1.588;0.828	1.527;0.704
FSA(NTr)	F(1,286)=0.552, p=.458	1.509;0.742	1.434;0.786

Non Smoker result on post exposure response between critical values

The critical value coping response classification (CV) showed that 43.8% of the non-smoking sample were in danger control, whereas 56.2% were in emotion control, which was not significantly different between threats; see appendix B.2.11 for breakdown. The classification was evaluated throughout the analysis to test Proposition #4 that: *'The critical value will significantly influence post exposure behavioural responses to each threat condition'*. The results are split into sections, initially the post-exposure behavioural responses are described using the conceptual model, and then the differences between post exposure behaviour responses between critical value classifications provided followed by the differences between emotional responses, message processing items and finally the perceived level of threat between critical value categories.

a) Non Smoker CV model

In order to assess how the critical value influenced post exposure future smoking intent and future smoking attitude, the structural equations model was amended to include the critical value and estimated the differences between threat classification. Table 5.34 shows the model provides good fit across the indicators which is illustrated in Figure 5.7 and showed that the model significantly estimated post exposure behaviour for physical threats only, although there were no significant differences between threats described in Table 5.35.

Figure 5.7 Non-Smoker CV model (Physical Threat V. Social Threat)

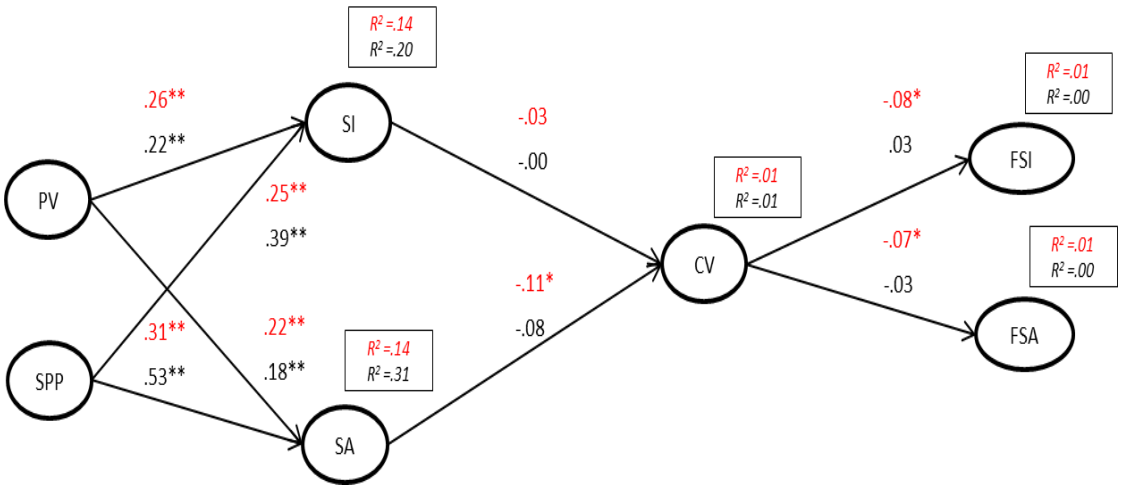


Table 5.34 CV Model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
4.0614	.909	.890	.868	.1461	.051

Table 5.35 Beta values and group differences for CV model

Relationship	Physical threat	Social threat	Group Difference
CV→FSA	β=-.07, p=.093	β=-.03, p=.553	z=0.790 (ns)
CV→FSI	β=-.08*, p=.055	β=.03, p=.468	z=1.008 (ns)

See appendix B.2.12 for regression weights and squared multiple correlations tables.

b) Non Smoker behaviour change based on critical value classification

The relationship between a) smoking attitude and future smoking attitude, and b) smoking intent and smoking intent was significant for both critical value categories for physical threats and social threats. Only the relationship between smoking attitude and future smoking attitude was significantly different between coping response classification for physical threats as shown in Table 5.36.

Table 5.36 Beta values and group differences for Non Smoker behaviours by CV

Threat	Relationship	Emotion Control	Danger Control	Group Difference
PTr	SA→FSA	β=.68**, p<.001.	β=.38**,p<.001	z=-1.851*
STr	SA→FSA	β=.65**, p<.001.	β=.41**,p<.001	z=-1.150(ns)
PTr	SI→FSI	β=.50**, p<.001.	β=.51**,p<.001	z=-1.418 (ns)
STr	SI→FSI	β=.49**, p<.001.	β=.50**,p<.001	z=-0.496 (ns)

See appendices B.2.13-16 for regression weights and squared multiple correlations tables.

c) Differences by the critical value categories

The differences between the post exposure responses were assessed between critical value categories. Initially the ANOVA for the post exposure smoking behaviours were described which was followed by the emotional responses.

Post-exposure behavioural response between critical value categories

The influence of the critical value on post-exposure future smoking attitude (FSA) and future smoking intent (FSI) is described in Table 5.37. Post exposure future smoking attitude was significantly different between critical response categories for all threats.

Table 5.37 Non Smoker post exposure behaviours between critical value

Factor	ANOVA	Emotion Control	Danger Control
FSA(PTr)	$F(1,608)=2.765^{.10}$,p=.097	1.460;0.764	1.564;0.758
FSA(STr)	F(1,579)=4.430*, p=.036	1.499;0.735	1.634;0.815
FSA(NTr)	F(1,246)=6.380*, p=.012	1.385;0.649	1.612;0.844
FSI(PTr)	F(1,608)=0.924, p=.337	1.450;0.799	1.515;0.847
FSI(STr)	F(1,579)=0.027, p=.869	1.498;0.777	1.507;0.766
FSI (NTr)	F(1,286)=1.498, p=.222	1.419;0.798	1.538;0.844

Emotional response between critical value categories

The influence of the critical value on physical emotional response (PEm) and social emotional response (SEm) is described in Table 5.38. Physical emotional response was significantly different between critical values to physical threats.

Table 5.38 Non Smoker emotional responses between critical value classification

Factor	ANOVA	Emotion Control	Danger Control
PEm(PTr)	F(1,608)=4.551*,p=.033	3.833;1.192	3.621;1.224
PEm(STr)	F(1,579)= 1.387,p=.239	2.934;1.355	2.802;1.330
PEm(NTr)	F(1,286)= 2.379,p=.124	2.347;1.485	2.087;1.354
SEm(PTr)	F(1,574)= 2.565,p=.110	2.317;1.381	2.147;1.212
SEm(STr)	F(1,579)= 0.164,p=.685	2.375;1.301	2.418;1.282
SEm(NTr)	F(1,286)= 0.553,p=.458	1.788;1.197	1.688;1.054

Non Smoker result on the influence of emotional response on behaviour

The emotional responses were included in analysis to see how they influence post-exposure behaviours to test Proposition #6 that: *'The type of emotional response will influence post exposure response'.* Initially the structural equations model was estimated with the physical emotional response (PEm) and then the social emotional response (SEm) influencing behaviour. Analysis was then completed between high and low levels of emotional response concluding how the level influences post exposure behaviour. Finally how the role that emotions depend on the critical value classification were explored.

a) Non Smoker Physical Emotional response model

The Physical emotional response factor was included in the model to estimate how the emotions influence future smoking intent and future smoking attitude, providing differences between responses to physical threats and social threats. The model

provides a very good fit across the indictors described in Table 5.39 which is illustrated in Figure 5.8 and shows that the emotions influenced post exposure responses with different levels of variance dependent upon the threat with significant differences between beta values that are described in Table 5.40. The physical emotional response model estimates future smoking intent for physical threats accounting for greater variance than social threats and acceptable variance toward future smoking attitude, with the beta values being significantly different between threats. This shows that the physical emotional response model significantly positively influenced future smoking attitude for physical threats.

Figure 5.8 Non-smoker PEm model (Physical Threat V. Social Threat)

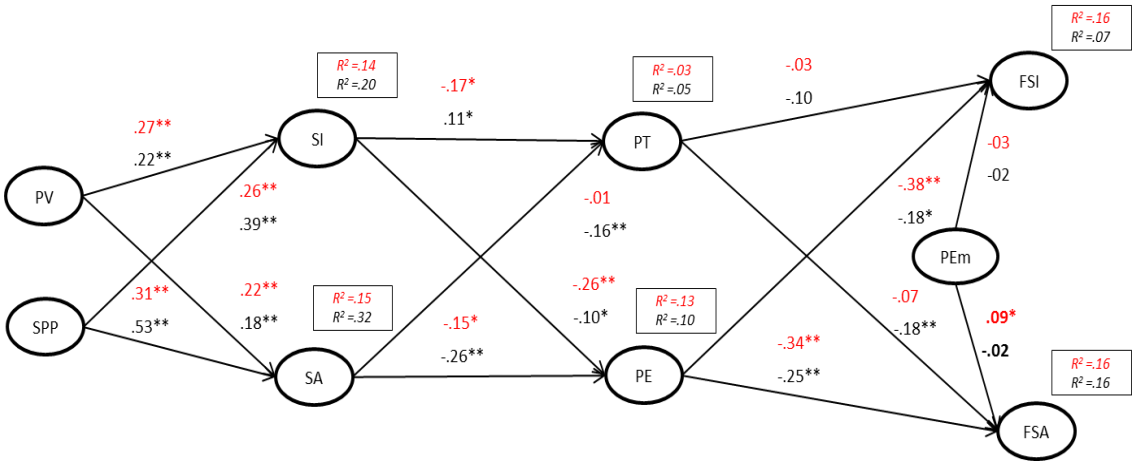


Table 5.39 PEm Model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
2.521	.906	.919	.908	.0849	.036

Table 5.40 Beta values and group differences for PEm model

Relationship	Physical threat	Social threat	Group Difference
PEm→FSA	β=.09*, p=.061	β=.02, p=ns	z=1.816*
PEm→FSI	β=-.03, p=ns	β=-.02, p=ns	z=0.054

See appendix B.2.17 for regression weights and squared multiple correlations tables.

b) Non Smoker Social Emotional response model

The Social emotional response factor was included in the model to estimate how the emotions influence future smoking intent and future smoking attitude, providing differences between responses to physical threats and social threats. The model provides a very good fit across the indictors described in Table 5.41, which is illustrated in Figure 5.9 and shows that the emotions influenced post exposure responses with different levels of variance dependent upon the threat, with differences between beta values described in in Table 5.42. This shows the social emotional response model estimated future smoking intent and smoking attitude with acceptable variance for physical threats with greater variance than social threats although no differences between beta values.

Figure 5.9 SEM model (Physical Threat V. Social Threat)

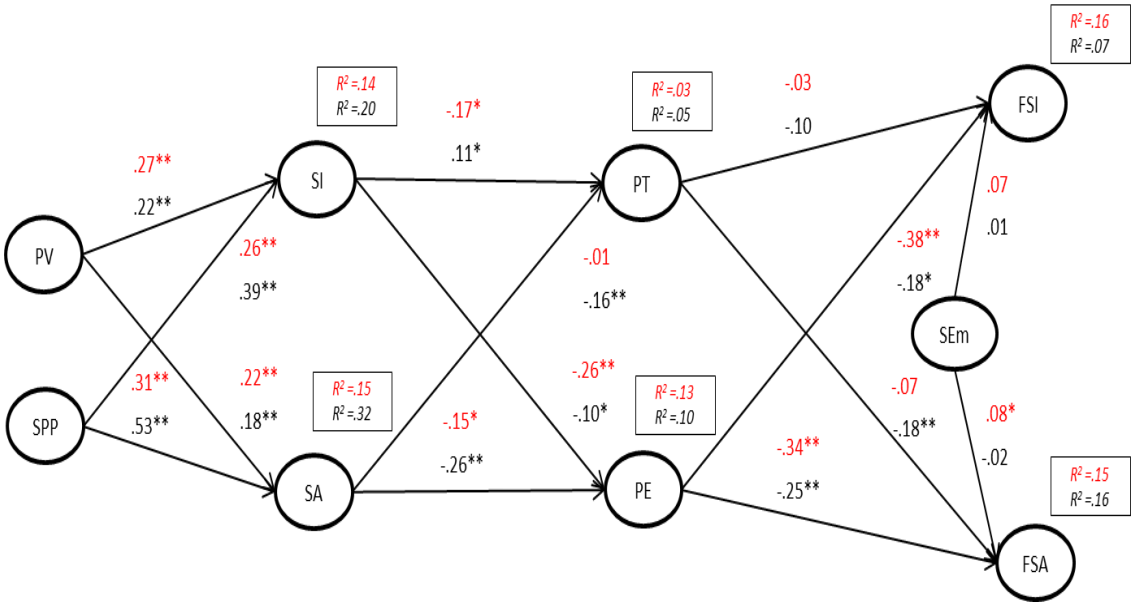


Table 5.41 SEm Model Fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
2.486	.907	.923	.914	.0829	.035

Table 5.42 Beta values and group differences for SEm model

Relationship	Physical threat	Social threat	Group Difference
SEm→FSA	β=.08*, p=.067	β=.02, p=ns	**z**=1.050
SEm→FSI	β=.07, p=ns	β=.01, p=ns	z=0.985

See appendix B.2.18 for regression weights and squared multiple correlations tables.

c) Differences by the level of emotional response categories

The difference between the post exposure, smoking behavioural responses was assessed between the high and low emotional response categories for each threat classification. Initially the physical emotional responses were assessed followed by the social emotional responses.

Physical emotional response and post exposure smoking behaviours

The influence of the level of physical emotional response on future smoking behaviour was analysed using correlations and ANOVA described in Table 5.43 and 5.44. There were no significant differences on future smoking attitude or future smoking intent depending on the level of physical emotional response.

Table 5.43 Correlation with level of physical emotional response and post exposure smoking behaviour responses

Factor	Correlation with PEm	Factor	Correlation with PEm
FSA(PTr)	r(610)=-0.010,p=.800	FSI(PTr)	r(610)=-0.031,p=.441
FSA(STr)	r(581)=-0.052,p=.207	FSI(STr)	r(581)=0.003, p=.934
FSA(NTr)	r(288)=-0.012,p=.844	FSI (NTr)	r(288)=-0.029,p=.628

Table 5.44 ANOVA with level of physical emotional response and post exposure smoking behaviour responses

Factor	ANOVA	Low PEm	High PEm
FSA(PTr)	F(1,608)=0.013, p=.909	1.495;0.718	1.504;0.773
FSA(STr)	F(1,579)=1.847, p=.175	1.609;0.821	1.521;0.733
FSA(NTr)	F(1,286)=0.872, p=.351	1.458;0.731	1.544;0.767
FSI(PTr)	F(1,151)=1.641, p=.202 (w)	1.574;0.903	1.455;0.798
FSI(STr)	F(1,579)=0.215, p=.643	1.519;0.786	1.489;0.759
FSI (NTr)	F(1,286)=0.063, p=.801	1.483;0.881	1.458;0.708

Social emotional response and post exposure smoking behaviours

The influence of the level of social emotional response on future smoking behaviour was analysed using correlations and ANOVA described Table 5.45 and 5.46. The level of social emotional responses to physical threats was shown to be positively correlated to future smoking intent and significantly different between the level of emotional response towards future smoking intent and future smoking attitude. Those with a high social emotional response towards physical threats had a significantly greater future smoking attitude and future smoking intent.

Table 5.45 Correlation with level of social emotion and post exposure smoking behaviour response

Factor	Correlation with SEm	Factor	Correlation with SEm
FSA(PTr)	r(610)=0.066, p=.102	FSI(PTr)	r(610)=0.076$^{.10}$,p=.062
FSA(STr)	r(581)=-0.017, p=.686	FSI(STr)	r(581)=-0.014, p=.729
FSA(NTr)	r(288)=0.006, p=.921	FSI (NTr)	r(288)=-0.031, p=.603

Table 5.46 ANOVA with level of social emotion and post exposure smoking behaviour response

Factor	ANOVA	Low SEm	High SEm
FSA(PTr)	F(1,309)=3.00$^{.10}$,p=.084(w)	1.465;.716	1.588;.854
FSA(STr)	F(1,579)=0.005, p=.943	1.560;.788	1.564;.775
FSA(NTr)	F(1,286)=0.033, p=.855	1.486;.763	1.507;.710
FSI(PTr)	F(1,317)=5.212*,p=.023(w)	1.423;.776	1.596;.898
FSI(STr)	F(1,579)=0.438, p=.508	1.519;.786	1.475;.746
FSI (NTr)	F(1,286)=0.179, p=672	1.484;.843	1.430;.715

Relationship between the emotional response and coping response

In order to establish how the coping response influences the relationship between the emotional responses and post exposure smoking behavioural measures, the relationship was estimated between critical values coping response classification for each threat condition. Although there were significant relationships between emotions and behaviour, there were only two significant differences shown in Table 5.47. The critical response classification was significantly different for the relationship between the physical emotional responses and future smoking intent; future smoking attitude towards social threats. Those in danger control had a significantly negative relationship between physical emotions and post exposure behaviours, whereas those in emotion control had a positive relationship.

Table 5.47 Non Smoker differences: Emotional response and behaviour by CV

Sample	Relationship	Emotion Control	Danger Control	Group Difference
STr	PEm →FSI	β=.12$^{.10}$, p=.056	β=-.15$^{.10}$, p=.086	z=-2.54**
PTr	PEm →FSI	β=.04, p=ns	β=-.07, p=ns	z=-1.120
STr	PEm →FSA	β=.05, p=ns	β=-.18*, p=.018	z=-2.26**
PTr	PEm →FSA	β=.04, p=ns	β=-.07, p=ns	z=-0.342
STr	SEm →FSI	β=.14*, p=.039	β=.00, p=ns	z=-1.540
PTr	SEm→FSI	β=.11$^{.10}$, p=071	β=.11, p=ns	z=0.351
STr	SEm→FSA	β=.00, p=ns	β=.00, p=ns	z=-0.341
PTr	SEM→FSA	β=.08, p=ns	β=.17*, p=.018	z=0.613

See appendices B.2.19-26 for regression weights and squared multiple correlation tables.

Summary of the Non-Smoker Sample

The non-smoker sample provided some innovative results showing that non-smokers' have significantly different responses between threat classifications, responding with greater involvement to physical threat appeals. The results indicated that the coping response influences greater message processing, with those in emotion control being significantly different to those in danger control. A full account of the significant responses is elaborated on in the discussion where the results are compared to smoker results and evaluated against the research propositions and hypothesis.

5.4 Data Analysis for the Smoker sample

To recap, the smoker sample consists of all those people who have tried smoking, even one puff of a cigarette. The segment are categorised as an experimenter in the smoker decision making model meaning they are no longer in the pre-contemplation stage of smoking and possess different motivations to non-smokers. Table 5.48 shows the distribution of smokers' samples characteristics.

Table 5.48 Smoker sample characteristics

No#	Av Age	Yr 7	Yr8	C Sch	G Sch	M	F
358	12.10	37.3%	62.7%	90.8%	9.2%	47.8%	52.2%

See appendix B.3.1 for the full school frequency table.

Smoker Factor Analysis

The factor analysis was conducted in two phases as described in Chapter Four, initially the exploratory factor analysis (EFA) was conducted with a proportion of the smokers *(n=150)* which was followed by the confirmatory factor analysis (CFA) with the remainder *(n=208)*. Then the structural equations model was estimated on the total smoker data set *(n=358)* applying the amendments from the factor analysis on the scales and factors to provide a reliable model fit and factors for further analysis.

a) Exploratory Factor Analysis

The initial exploratory factor analysis was conducted with 150 adolescents who had experimented with smoking. This was reported using measures of sampling adequacy and also convergent, discriminant and reliability tests. The sample was adequate for factor analysis based on the interpretation of the Kaiser-Meyer-Olkin statistic being high (KMO=.835). The Bartlett Test of Sphericity confirmed the 8 factors ($p<.001$; Chi-Square=3381.98/ df=703) accounted for 59.48% of the total variance based on the eigenvalues criteria. Using the thresholds highlighted in sub-sections 4.5 and 5.2.1 (a) the exploratory factor analysis pattern matrix showed there were no cross loadings between factors and all factors had acceptable loadings, Table 5.49 shows that Cronbach Alphas (α's) was acceptable, the Composite Reliabilities (CR) all reliable, and the Average Variance Explained (AVE) was acceptable. The factors close to the threshold were verified to be significantly different and not convergent using the squared correlation discriminant reliability test. The factor correlation matrix had no convergences, and regression tests confirmed that there was significant linear

relationships between all paths expected in the model; see appendices B.3.2.-3 for the pattern matrix, discriminant reliability tests and the full factor correlation matrix.

Table 5.49 Reliability tests

Factor	PT	SI	PV	FSA	SA	FSIQ	PE	SPP
α	.919	.909	.842	.793	.764	.899	.778	.824
CR	.921	.905	.851	.812	.753	.870	.757	.689
AVE	.625	.660	.490	.477	.385	.692	.448	.457

b) Confirmatory Factor Analysis

The confirmatory factor analysis was conducted with the remaining 208 adolescents who had experimented with smoking. The factor loadings and model fit are reported followed by the convergent, discriminant and reliability tests. The confirmatory factor analysis shows that after theoretical consideration and removing the largest modification indices while retaining a representative amount of items per factor, the model had a good fit across the indicators described in Table 5.50. 8 factors accounted for 70.61% of the total variance expressed in Factor Path Diagram illustrated in Figure 5.10 showing that the factor loadings are all reliable.

Figure 5.10 Factor Path Diagram

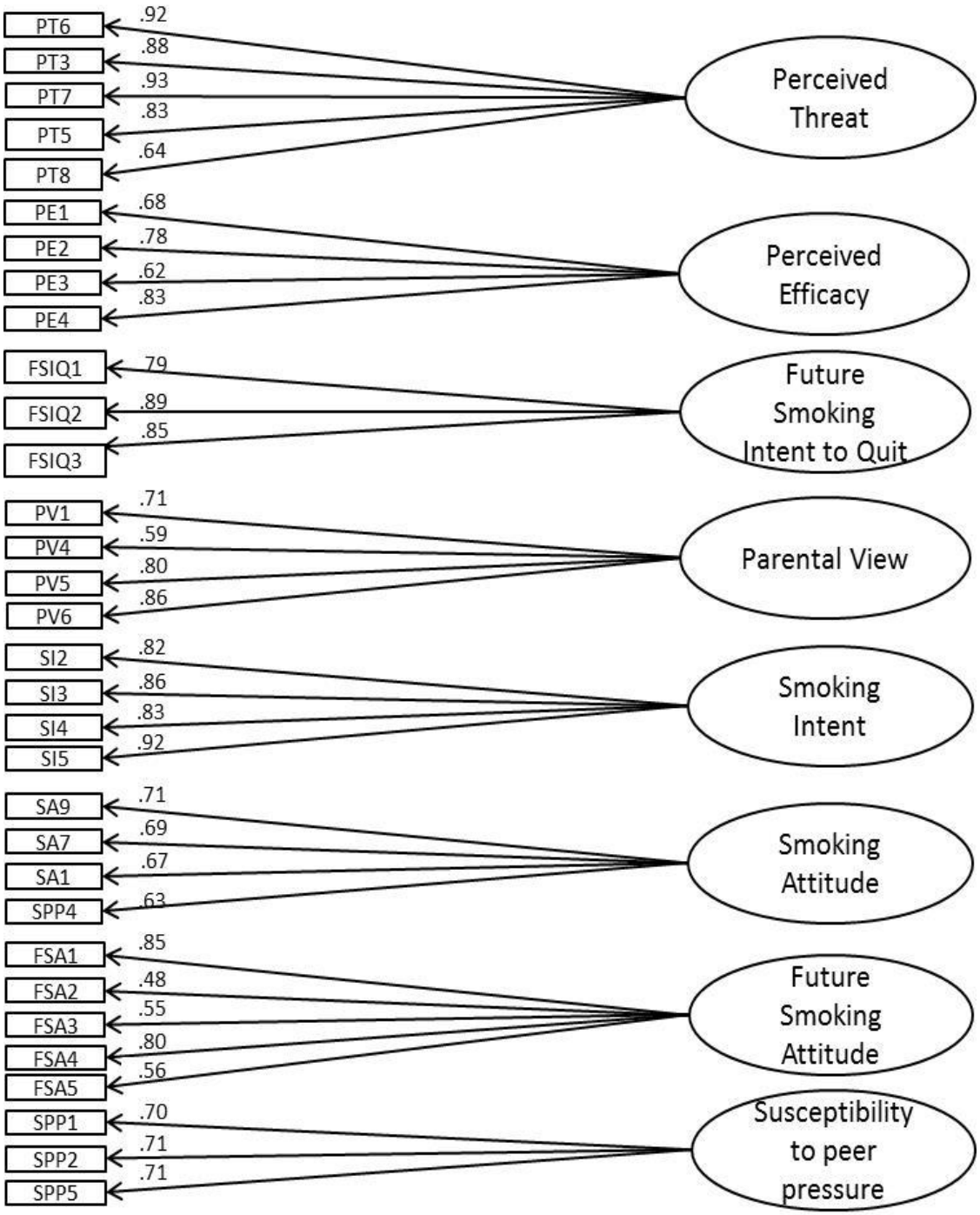


Table 5.50 Model Fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.513	.842	.938	.930	.0604	.050

Using the same thresholds highlighted in sub-sections 4.5 and 5.2.1 (a), Table 5.51 shows that the Cronbach Alpha (α's) scores were acceptable. The Composite Reliability (CR) was reliable and the Average Variance Explained (AVE) was satisfactory. The factors close to the threshold were verified to discriminate using the squared correlation test or based on theoretical assumptions. Smoking Attitude was shown to converge with Future Smoking Attitude and Susceptibility to Peer Pressure, which was expected as the items have similar facets for smokers. The correlation matrix showed Smoking Attitude (SA) and Susceptibility to Peer Pressure (SPP) were highly correlated (r=0.833) which was theoretically expected as previous studies showed that smokers' have higher proportions of friends that smoke and greater social influence being confirmed by the preliminary tests in section 4.6. Regression tests confirmed that there were significant linear relationships between all paths expected in the structural equation model; see appendices B.3.4-6 for full tests including discriminant reliability and the factor correlation table.

Table 5.51 Reliability tests

Factor	PV	PT	SA	SI	FSA	FSIQ	PE	SPP
α	.820	.921	.768	.899	.778	.879	.817	.749
CR	.833	.925	.770	.899	.790	.881	.820	.748
AVE	.559	.714	.455	.691	.442	.712	.536	.498

Smoker sample analysis

The factor analysis confirmed the factors to be used in the structural equation model and further analysis which was conducted with the entire sample of smokers (*n=368*). The Cronbach Alpha (α's) Table 5.52 shows the scales are acceptable.

Table 5.52 Cronbach α's results

Factor	SI	SA	SPP	PV	PE	PT	FSA	FSIQ
α	.899	.762	.783	.811	.803	.916	.783	.887

The analysis is segmented by the propositions initially reviewing the conceptual model and the role of social influence upon smoking behaviour. The difference between responses to threat appeals is reviewed followed by the perceived level of threat. To conclude the difference between the critical value classifications is assessed followed by the role of the two clusters of emotional responses.

Smoker result on Social influence on behaviour

The role that social influences have upon pre-exposure behaviour intent and attitude were analysed to test Proposition #5 that: *'Social factors will significantly influence smoking beliefs and attitudes'.*

a) Initial Smoker results for social influence correlation

The Pearson correlation summarized in Table 5.53 shows that smokers' susceptibility to peer pressure and parental view on smoking were significantly positively correlated to smoking intent and smoking attitude. These results suggest a significant relationship between the social influence factor and the self-reported smoking attitude and smoking intent.

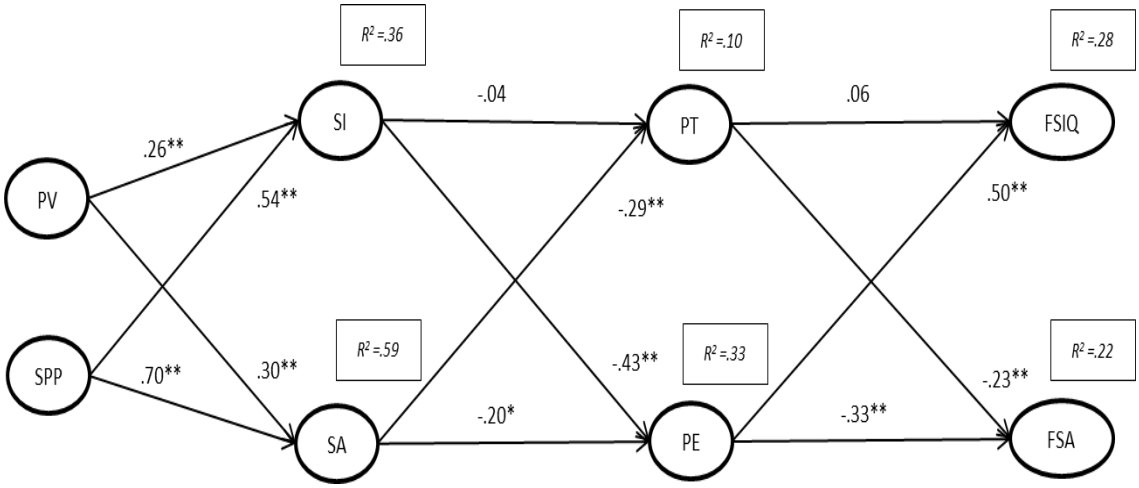
Table 5.53 Correlation between social factors and smoking response

Factor	Correlation with Smoking Intent	Correlation with Smoking Attitude
SPP	r(358)=0.513**, p<.001	r(358)=0.595**, p<.001
PV	r(358)=0.367**, p<.001	r(358)=0.374**, p<.001

b) Full smoker conceptual model

The full structural equation model was predicted to assess how it estimates smoker self-reported behaviour regardless of the classification of threat appeal observed. The model provides a very good fit across the indicators described in Table 5.54 that estimates future smoking attitude and future smoking intent to quit with acceptable variance shown in Figure 5.11. Social factors significantly estimate smoking attitude and smoking intent to quit accounting for high levels of variance for both factors.

Figure 5.11 Smoker full model



**p<.001, * p<.05

Table 5.54 Smoker full model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.914	.871	.931	.923	.095	.051

See appendix B.3.7 for regression weights and squared multiple correlations tables.

Smoker results on Post-exposure responses between threat categories

The post-exposure responses towards each threat were assessed, the observations per threat were 41.9% social threat (*n=150*), 41.3% physical threats (*n=148*) and 16.8% non-threat condition (*n=60*) and analysed against each other to understand the differences between threats and test Proposition #2 that: *'Post exposure behavioural responses will be significantly different between threats'.* The results are split into sections; initially the post-exposure behavioural responses are described using the structural equations model. This is followed by the difference between responses to threats is provided.

a) Smoker full model for social and physical threats

The structural equation model was estimated to assess the differences between threat classifications for the smoker sample. The model provides very good fit across the indictors described in Table 5.55 which is also illustrated in Figure 5.12. The model estimates post exposure smoking attitude and intention behaviours towards both threats with differing levels of variance, being greater for social threats. Table 5.56 shows the significant differences between threats for the relationship between perceived threat and smoking intent.

Figure 5.12 Smoker full model (Physical Threat V. Social Threat)

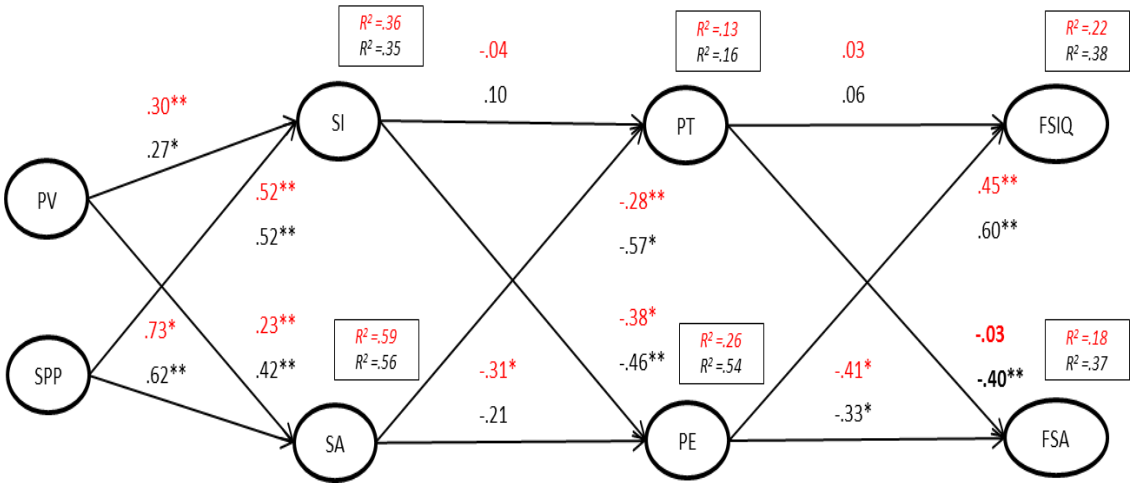


Table 5.55 Smoker full model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.545	.784	.907	.897	.1029	.043

Table 5.56 Beta values and group differences for Smoker full model

Relationship	Social threat	Physical threat	Group Difference
PT→FSA	β=-.40**, p<.001	β=-.03, p=ns	z=-2.745***
PT→FSIQ	β=.06, p=ns	β=.03, p=ns	z=0.253
PE→FSA	β=-.33*, p=.002	β =-.41*, p=004	z=0.481
PE→FSIQ	β=.60**, p<.001	β =.45**, p<.001	z=0.036

See appendix B.3.8 for regression weights and squared multiple correlations tables.

b) Behaviour differences between threats

The difference between pre and post exposure behaviour is provided between threats which was followed by the ANOVA results between responses to the threats for behaviours, emotional responses, message processing and perceived level of threat.

Pre and post attitudinal difference

The difference between base line self-reported smoking response and post exposure self-reported smoking response between threats is described in Table 5.57 showing no significant differences between threat categories

Table 5.57 Group difference between pre and post exposure responses

Relationship	Physical threat	Social threat	Group Difference
SA→FSA	β=.60**, p<.001	β=.60**, p<.001	z=-0.081
SI→FSIQ	β=-.30**, p<.001	β=-.51**, p<.001	z=-1.407

See appendices B.3.9-10 for regression weights and squared multiple correlations tables.

Post-exposure behavioural response between threat categories

The influence of the type of threat on future smoking attitude and future smoking intent to quit is described in Table 5.58. Post exposure behaviour responses were not significantly different between threat conditions.

Table 5.58 Smoker ANOVA post exposure behaviour responses between conditions

Factor	ANOVA	Social Threat	Physical Threat	Non Threat
FSA	F(2,355)=0.427,p=.653	2.287;0.912	2.234;0.902	2.161;0.902
FSIQ	F(2,355)=1.272,p=.281	4.040;1.060	3.864;1.223	4.089;1.052

Post exposure emotions and message processing response between threat categories

The influence of the type of threat on the post exposure physical emotional response (PEm) and the social emotional response (SEm), alongside message processing factors is described in Table 5.59. The emotional responses were significantly different between threat conditions, with the physical emotional response being significantly greater towards physical threats than social threats, while there were no differences for the social emotional responses between threats. The message processing items were significantly influenced by the type of threat, with the ATAD being significantly greater towards physical threats than social threats and AAD greater towards physical threats. The perceived level of threat was significantly different between threat conditions being significantly greater towards physical threats than social threat.

Table 5.59 Smoker ANOVA post exposure responses between threat conditions

Factor	ANOVA	Social Threat	Physical Threat	Non Threat
PEm	F(2,355)=22.821**,p<.001	2.405;1.117	3.150;1.196	2.100;1.316
SEm	F(2,355)=14.078**,p<.001	2.747;1.138	2.661;1.187	1.844;1.109
AAD	F(2,150)=7.221**, p=.001	3.210;.963	3.431;1.045	2.712;1.332
ATAD	F(2,153)=12.914**,p<.001	2.812;.996	3.292;1.059	2.499;1.253
MD	F(2,154)=1.351,p=.262(w)	2.588;1.047	2.747;.954	2.825;1.185
PLT	F(2,355)=16.053**,p<.001	2.695;1.252	3.295;1.328	2.223;1.487

Smoker results on perceived level of threat and behavioural measures

The influence that the perceived level of threat has on post exposure responses was analysed to test Proposition #3 that: *'The perceived level of threat will significantly influence post exposure responses to each threat condition'.* Initially the level of threat was correlated with the post exposure behaviour items, which was followed by ANOVA tests between the high and low perceived levels of threat categories. Perceived level of threat had a significant relationship with future smoking intent to quit and future smoking attitude shown in Table 5.60 and Table 5.61. The FSIQ was significantly negatively correlated to the perceived level of threat for physical threat conditions, and the FSA was weakly significantly negatively correlated to the perceived level of threat for physical threat conditions. Yet, the FSIQ and the FSA was not significantly different between level of threat categories for physical threats or responses towards the social threat and non-threat conditions.

Table 5.60 Smoker perceived level of threat classification differences

Factor	Correlation with LT	Factor	Correlation with LT
FSIQ(PTr)	r(148)=0.173*, p=.036	FSA(PTr)	r(148)=-0.137[.10],p=.097
FSIQ(STr)	r(150)=0.027, p=.746	FSA(STr)	r(150)=-0.082, p=.319
FSIQ(NTr)	r(60)=0.112, p=.393	FSA(NTr)	r(60)=-0.128, p=.332

Table 5.61 Smoker perceived level of threat classification differences

Factor	ANOVA	Low LT	High LT
FSIQ(PTr)	F(1,146)=2.099, p=.150	3.717;1.293	4.007;1.141
FSIQ(STr)	F(1,148)=0.890, p=.347	3.983;1.110	4.157;0.947
FSIQ(NTr)	F(1,58)=0.005, p=.942	4.095;1.087	4.073;0.982
FSA(PTr)	F(1,146)=1.733, p=.190	2.334;0.947	2.139;0.851
FSA(STr)	F(1,148)=0.331, p=.566	2.317;0.947	2.225;0.842
FSA(NTr)	F(1,58)=0.500, p=.482	2.210;0.868	2.024;1.005

Smoker result on post exposure response between critical values

The critical value coping response classification (CV) showed that 54.5% of the smoking sample was in danger control, whereas 45.5% were in emotion control, which was not significantly different between threats; see appendix B.3.11 for breakdown. The classification was evaluated throughout the analysis to test Proposition #4 that: *'The critical value will significantly influence post exposure behavioural responses to each threat condition'*. The results are split into sections,

initially the post-exposure behavioural responses are described using the conceptual model, and then the differences between post exposure behaviour responses between critical value classifications are described which are followed by the differences between emotional responses, message processing items and finally the perceived level of threat between critical value categories.

a) Smoker CV model

In order to assess how the critical value influences post exposure future smoking intent to quit and future smoking attitude the structural equations model was amended to include the critical value and estimates the differences between threat classification. Table 5.62 shows the model provides good fit across the indicators which is illustrated in Figure 5.13 and shows that the model significantly estimates post exposure behaviour for future smoking intent to quit to social threats only, although there were no significant differences between threats described in Table 5.63.

Figure 5.13 Smoker CV model (Physical Threat V. Social Threat)

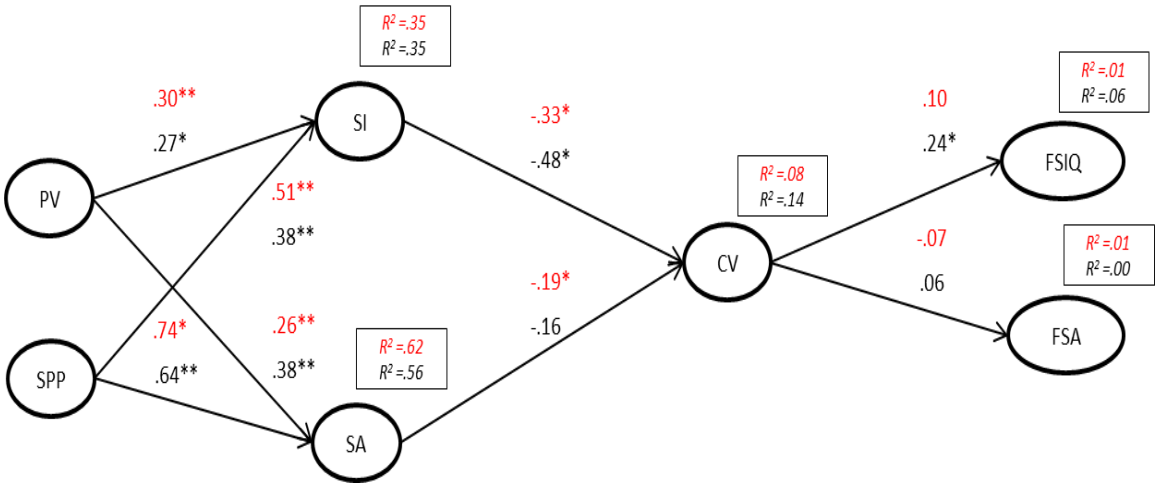


Table 5.62 CV model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.752	.814	.891	.877	.1662	.050

Table 5.63 Beta values and group differences for CV model

Relationship	Physical threat	Social threat	Group Difference
CV→FSA	β=.07., p=.422	β=.06., p=.528	z=1.016 (ns)
CV→FSIQ	β=.10., p=.243	β=.24*.p=.006	z=0.796 (ns)

See appendix B.3.12 for regression weights and squared multiple correlations tables.

b) Smoker behaviour change based on critical value classification

Although the relationship between a) smoking attitude and future smoking attitude, and b) smoking intent and smoking intent was significant for both critical value categories for physical threats and social threats, only the future smoking attitude was significantly different between coping response classification for social threats as shown in Table 5.64.

Table 5.64 Beta values and group differences for Smoker behaviours by CV

Threat	Relationship	Emotion Control	Danger Control	Group Difference
PTr	SA→FSA	β=.62**, p<.001	β=.57**, p<.001	z=-0.197 (ns)
STr	SA→FSA	β=.54**, p<.001	β=.75**, p<.001	z=1.847*
PTr	SI→FSIQ	β=-.28*, p=.025	β=-.37*, p=.003	z=-0.925 (ns)
STr	SI→FSIQ	β=-.39*, p=.009	β=-.56**,p<.001	z=-0.721 (ns)

See appendices B.3.13-16 for regression weights and squared multiple correlations tables.

c) Differences by the critical value categories

The differences between the post exposure responses were assessed between critical value categories. Initially the ANOVA for the post exposure smoking behaviours are described which are followed by the emotional responses, message processing factors and the perceived level of threat.

Post-exposure behavioural response between critical value categories

The influence of the critical value on post-exposure future smoking attitude (FSA) and future smoking intent to quit (FSIQ) is described in Table 5.65 which shows the post exposure future smoking attitude was significantly different between critical response categories for social threats.

Table 5.65 Smoker post exposure behaviours between critical value

Factor	ANOVA	Emotion Control	Danger Control
FSA(PTr)	F(1,146)=.241, p=.624	2.318;.823	2.146;0.978
FSA(STr)	F(1,148)=6.441*, p=.012	3.776;1.145	4.216;0.965
FSA(NTr)	F(1,58)=0.821, p=.369	2.040;0.847	2.253;0.943
FSIQ(PTr)	F(1,146)=.241, p=.624	3.816;1.212	3.915;1.242
FSIQ(STr)	F(1,148)=.000, p=.998	2.287;0.869	2.287;0.945
FSIQ(NTr)	F(1,58)=0.016, p=.900	4.109;1.001	4.074;1.103

Emotional response between critical value categories

The influence of the critical value on physical emotional response (PEm) and social emotional response (SEm) is described in Table 5.66 which shows the physical emotional response and social emotional response was not significantly different between the critical value categories for any threat conditions.

Table 5.66 Smoker emotional responses between critical value classification

Factor	ANOVA	Emotion Control	Danger Control
PEm(PTr)	F(1,146)=.211, p=.647	3.106;1.057	3.197;1.337
PEm(STr)	F(1,148)=.877, p=.351	2.300;0.975	2.474;1.203
PEm(NTr)	F(1,58)=.011, p=.918	2.120;1.413	2.085;1.259
SEm(PTr)	F(1,146)=.093, p=.761	2.689;1.065	2.630;1.313
SEm(STr)	F(1,148)=.222, p=.639	2.694;1.141	2.783;1.141
SEm(NTr)	F(1,58)=.174, p=.678	1.776;1.119	1.897;1.115

Smoker result on the influence of emotional response on behaviour

The emotional responses were analysed to see the influence on post-exposure behaviours to test Proposition #6 that: *'The type of emotional response will influence post exposure response'.* Initially the structural equations model was estimated with the physical emotional response (PEm) and then the social emotional response (SEm) influencing behaviour. Then analysis was completed between high and low levels of emotional response concluding how the level influences post exposure behaviour. Finally, the role that emotions and the critical value classification are described.

a) Smoker Physical Emotional response model

The Physical emotional response (PEm) factor was included in the model to estimate how the emotions influence future smoking intent to quit and future smoking attitude providing any differences between responses to physical threats and social threats. The model provided a satisfactory fit across the indictors described in Table 5.67. This is illustrated in Figure 5.14 and shows that the emotions influence post exposure responses with different levels of variance dependent upon the threat with significant differences between beta values described in Table 5.68. The PEm model estimates future smoking intent to quit and smoking attitude differently to each threat, with social threats having the highest levels of variance, double that of physical threats. The beta values were significantly different between threats showing that the physical emotional response significantly positively influences future smoking intent to quit for physical threats, whereas social threats significantly reduce future smoking attitude.

Figure 5.14 PEm model (Physical Threat V. Social Threat)

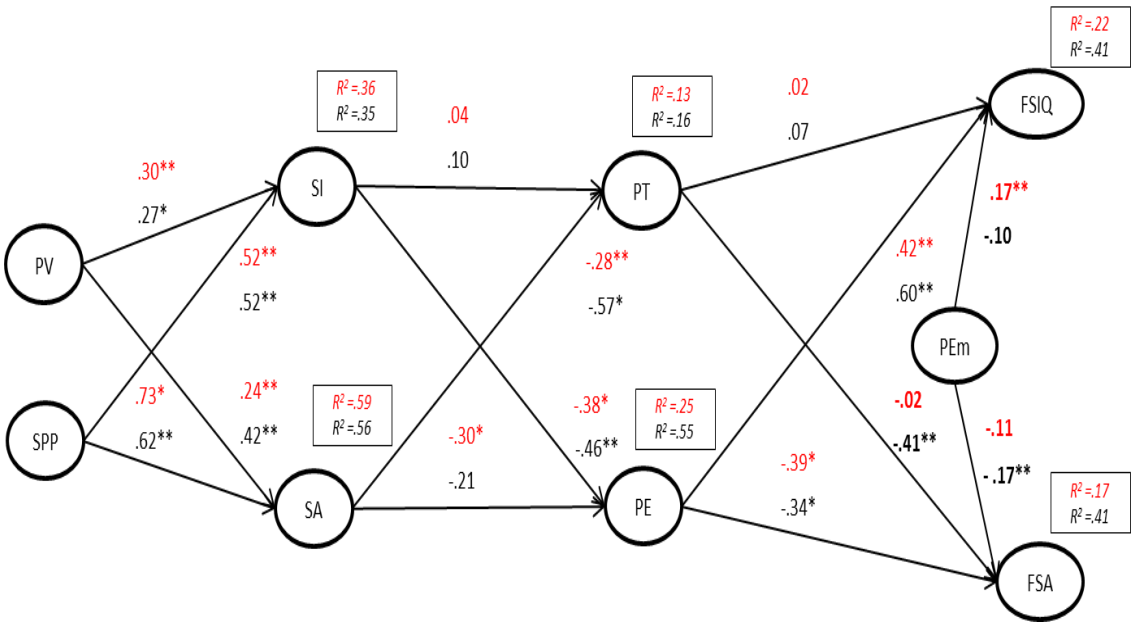


Table 5.67 PEm Model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.519	.769	.898	.889	.0957	.042

Table 5.68 Beta values and group differences for Smoker behaviours by PEm values

Relationship	Physical threat	Social threat	Group Difference
PEm→FSA	β=-.11, p=ns	β=.17$^{.10}$, p=.053	z=-2.019**
PEm→FSIQ	β=.17*, p=.044	β=-.10, p=ns	z=2.362**

See appendix B.3.17 for regression weights and squared multiple correlations tables.

b) Smoker Social Emotional response model

The Social emotional response (SEm) factor was included in the model to estimate how the emotions influence future smoking intent to quit and future smoking attitude providing any differences between responses to physical threats and social threats. The model provided a satisfactory fit across the indictors described in Table 5.69. This is illustrated in Figure 5.15 and shows that the emotions influence post exposure responses with different levels of variance dependent upon the threat with significant differences between physical and social threats beta values described in Table 5.70. The model estimated future smoking intent to quit and smoking attitude differently to each threat, with social threats having the highest levels of variance, double that of physical threats. The beta values were significantly different between threats showing that the social emotional response significantly positively influences future smoking intent to quit towards social threats.

Figure 5.15 SEm model (Physical Threat V. Social Threat)

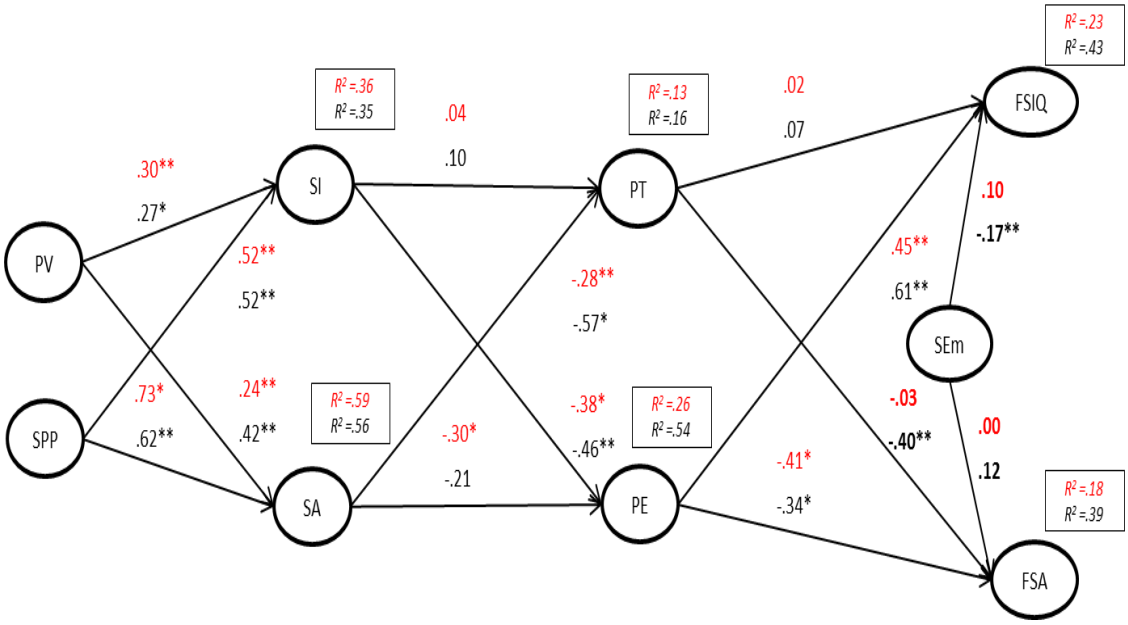


Table 5.69 SEm Model fit

CM/DF	GFI	CFI	TLI	SRMR	RMSEA
1.520	.770	.899	.889	.0957	.042

Table 5.70 Beta values and group differences for SEM model

Relationship	Physical threat	Social threat	Group Difference
SEm→FSA	β=.00, p=ns	β=.12, p=ns	z=0.925
SEm→FSIQ	β=.10, p=ns	β=-.17*, p=.038	z=2.159**

See appendix B.3.18 for regression weights and squared multiple correlations tables.

c) Differences by the level of emotional response categories

The difference between the post exposure, smoking behavioural responses was assessed between the high and low emotional response categories for each threat classification. Initially the physical emotional responses were assessed followed by the social emotional responses.

Physical emotional response and post exposure smoking behaviours

The influence of the level of physical emotional response on future smoking behaviour was analysed using correlations and ANOVA described in Tabled 6.71 and 6.72. The level of physical emotional responses to physical threats was shown to be correlated to future smoking intent to quit and significantly different between the level of emotional response towards future smoking intent to quit.

Table 5.71 Correlation with level of physical emotional response and post exposure smoking behaviour responses

Factor	Correlation with PEm	Factor	Correlation with PEm
FSIQ(PTr)	r(148)=0.323**,p<.001	FSA(PTr)	r(148)=-0.122, p=.141
FSIQ(STr)	r(150)=-0.051, p=.537	FSA(STr)	r(150)=0.076, p=.355
FSIQ(NTr)	r(60)=0.163, p=.213	FSA(NTr)	r(60)=-0.197, p=.131

Table 5.72 ANOVA with level of physical emotional response and post exposure smoking behaviour responses

Factor	ANOVA	Low PEm	High PEm
FSIQ(PTr)	F(1,146)=6.854*,p=.010	3.542;1.303	4.071;1.127
FSIQ(STr)	F(1,148)=0.874, p=.351	4.105;1.039	3.940;1.092
FSIQ(NTr)	F(1,58)=1.724, p=.194	3.973;1.212	4.360;0.832
FSA(PTr)	F(1,146)=.913, p=.341	2.324;0.964	2.179;0.860
FSA(STr)	F(1,148)=2.508, p=.115	2.193;0.879	2.433;0.951
FSA(NTr)	F(1,58)=.783, p=.380	2.229;0.855	2.004;1.011

Social emotional response and post exposure smoking behaviours

The influence of the level of social emotional response on future smoking behaviour was analysed using correlations and ANOVA described Table 5.73 and 5.74. The level of social emotional responses to physical threats was positively correlated to future smoking intent to quit, but no significant differences between the level of emotional response and future smoking behaviour.

Table 5.73 Correlation with level of social emotional response and post exposure smoking behaviour responses

Factor	Correlation with SEm	Factor	Correlation with SEm
FSIQ(PTr)	r(148)=0.164*, p=.046	FSA(PTr)	r(148)=-0.023, p=.780
FSIQ(STr)	r(150)=-0.058, p=.479	FSA(STr)	r(150)=-0.015, p=.857
FSIQ(NTr)	r(60)=0.077, p=.558	FSA(NTr)	r(60)=-0.116, p=.377

Table 5.74 ANOVA with level of social emotional response and post exposure smoking behaviour responses

Factor	ANOVA	Low SEm	High SEm
FSIQ(PTr)	F(1,146)=2.130, p=.147	3.738;1.289	4.034;1.116
FSIQ(STr)	F(1,148)=0.004, p=.952	4.045;1.120	4.035;0.998
FSIQ(NTr)	F(1,58)=0.230, p=.633	4.056;1.090	4.220;0.913
FSA(PTr)	F(1,146)=.009, p=.925	2.241;0.977	2.227;0.796
FSA(STr)	F(1,148)=.366, p=.546	2.331;0.965	2.240;0.856
FSA(NTr)	F(1,58)=.306, p=.582	2.193;0.867	2.032;1.060

Relationship between the emotional response and coping response

In order to establish how the coping response influences the relationship between the emotional responses and post exposure smoking behavioural measures, the relationship between critical values coping response classification for each threat condition were estimated. Although there were significant relationships between emotions and behaviour, there was only one significant difference shown in Table 5.75. The critical response classification was significantly different for the relationship between the physical emotional responses and future smoking attitude towards social threats. Yet the beta values between individual relationships were not significant providing support for further research.

Table 5.75 Smoker Group differences: Emotional response and behaviour by CV

Sample	Relationship	Emotion Control	Danger Control	Group Difference
STr	PEm →FSIQ	β=.14, p=ns	β=-.11, p=ns	z=-1.277
PTr	PEm →FSIQ	β=.16, p=ns	β=.40*, p=.004	z=0.166
STr	PEm →FSA	β=-.19, p=ns	β=.13, p=ns	z=1.671*
PTr	PEm →FSA	β=.03, p=ns	β=-.20, p=ns	z=0.784
STr	SEm →FSIQ	β=.09, p=ns	β=-.09, p=ns	z=-0.938
PTr	SEm→FSIQ	β=.13, p=ns	β=.14, p=ns	z=-0.095
STr	SEm→FSA	β=-.01, p=ns	β=.05, p=ns	z=0.335
PTr	SEM→FSA	β=.10, p=ns	β=-.14, p=ns	z=-0.095

See appendices B.3.19-26 for regression weights and squared multiple correlations tables.

Summary of the Smoker Sample

The smoker sample provided some innovative results showing that smokers' have significantly different responses between threats, responding with greater involvement to physical threat appeals. Yet, the social threats influenced coping response which resulted in an adaptive coping response classification. This could be attributed to the coping response being influenced by optimistic bias and negativity bias towards social threats, but physical threats also be influenced by greater message processing. The critical value coping response significantly influenced an adaptive coping response and was significantly different to those in danger control. A full account of the significant responses is elaborated on in the discussion where the results are compared to non-smoker results and evaluated against the research propositions and hypothesis.

5.5 Research Propositions and hypothesis summary

The six research propositions consist of a number of hypotheses described below:

Proposition #1*: 'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'*		✗/✓
H(1.11)	Smokers' will have a more positive smoking attitude than non-smokers'	✓
H(1.12)	Smokers' will have a more positive smoking intent than non-smokers'	✓
H(1.21)	Smokers' will have a more positive parental view towards smoking than non-smokers'	✓
H(1.22)	Smokers' will have a more positive susceptibility to peer pressure than non-smokers'	✓
H(1.23)	Smokers' will have a more negative school motivation than non-smokers'	✓
H(1.31)	Smokers' perceived efficacy towards smoking will be more positive than non-smokers'	✓
H(1.32)	Smokers' perceived threat towards smoking will be more negative than non-smokers'	✗
H(1.33)	Smokers' will have a more positive social emotional response than non-smokers'	✓
H(1.34)	Non-smokers' will have a more positive physical emotional response than smokers'	✓
H(1.35)	Non-smokers' will have a more positive attitude towards the advert than smokers'	✓
H(1.36)	Non-smokers' will have a more positive attention towards the advert than smokers'	✓
H(1.37)	Smokers' will have a more positive message derogation than non-smokers'	✓
H(1.41)	Non-smokers' will have a more positive perceived level of threat towards the advert than smokers'	✓
H(1.51)	Non-smokers' will have a more positive critical value than smokers'	✓

→Proposition #1 proved that non-smokers' and smokers' have consistently different response and influential factors upon their smoking behaviour.

Proposition #2: *'Post exposure behavioural responses will be significantly different between threats'*		✖/✓
H(2.11)	Physical threats will produce a more negative attitude towards smoking than social threats	✓
H(2.12)	Physical threats will produce a more negative smoking intent than social threats	✓
H(2.13)	Physical threats will produce a more positive smoking intent to quit than social threats	✓
H(2.21)	Physical threats will produce a more positive physical emotional response than social threats	✓
H(2.22)	Social threats will produce a more positive social emotional response than physical threats	✓
H(2.31)	The attitude towards the advert based on physical threats will be more positive than based on social threats	✓
H(2.32)	The attention towards advert for physical threats will be more positive than social threats	✓
H(2.33)	The message derogation towards physical threats will be a more positive than social threats	✖
H(2.41)	The perceived level of threat towards physical threats will be a more positive than social threats	✓

→Proposition #2 shows that physical threats consistently influence the greatest amount of involvement, emotions and message processing than responses to social threats.

Proposition #3: *'The perceived level of threat will significantly influence post exposure responses to each threat condition'*		✖/✓
H(3.11)	The future smoking intent will be more negative for those with a high perceived level of threat towards the threat appeal	✓
H(3.12)	The future smoking attitude will be more negative for those with a high perceived level of threat towards the threat appeal	✓
H(3.13)	The future smoking intent to quit will be more positive for those with a high perceived level of threat towards the threat appeal	✓

→Proposition # 3 outlines that the greater the perceived level of threat the more influential and persuasive the threat is and influence the subsequent coping response.

Proposition #4: *'The critical value will significantly influence post exposure behavioural responses to each threat condition'*	✖/✓
H(4.11)	Danger control will lead to a more negative attitude towards smoking than emotion control	✓
H(4.12)	Danger control will lead to a more negative smoking intent than emotion control	✓
H(4.13)	Danger control will lead to a more positive smoking intent to quit than emotion control (ST)	✓
H(4.21)	Danger control will lead to a more negative physical emotional response than emotion control	✓
H(4.22)	Danger control will lead to a more negative social emotional response than emotion control	✓
H(4.31)	Danger control will lead to a more negative attitude towards the advert than emotion control	✓
H(4.32)	Danger control will lead to a more negative attention towards the advert than emotion control	✓
H(4.33)	Danger control will lead to a more negative message derogation than emotion control	✖
H(4.41)	Danger control will lead to a more negative perceived level of threat than emotion control	✓
H(4.51)	The critical value will mediate the future smoking attitude	✓

→Proposition#4 outlines that using the coping response as a classification method provide insight into response regulation to a threatening advertisement.

Proposition #5*: 'Social factors will significantly influence smoking beliefs and attitudes'*	✖/✓
H(5.11)	A positive susceptibility to peer pressure will be associated with a more positive smoking attitude.	✓
H(5.12)	A positive susceptibility to peer pressure will be associated with a more positive smoking intent.	✓
H(5.13)	A positive parental view on smoking will be associated with a more positive smoking attitude.	✓
H(5.14)	A positive parental view on smoking will be associated with a more positive smoking intent.	✓

→Proposition #5 shows that the role of social influence is supported outlining how a positive social influence relates to a positive smoking behaviour, attitude and intent.

Proposition #6*: 'The type of emotional response will influence post exposure response'*		✖/✓
H(6.11)	A positive social emotional response will be associated with a more positive smoking attitude	✓
H(6.12)	A positive social emotional response will be associated with a more positive smoking intent	✓
H(6.13)	A positive physical emotional response will be associated with a more positive smoking attitude	✓
H(6.14)	A positive physical emotional response will be associated with a more positive smoking intent	✓
H(6.15)	A positive social emotional response will be associated with a more positive smoking intent to quit	✓
H(6.16)	A positive physical emotional response will be associated with a more positive smoking intent to quit	✓

→Proposition#6 shows that emotions have an influential role on responses. The findings show that social emotional clusters are important to be elicited from health advertisements instead of 'fear' or physical emotions that influence a maladaptive coping response and boomerang effect.

5.6 Summary

This chapter provided the results which were analysed in three stages, initially as an entire sample to assess the differences between non-smokers' and smokers' and the social influence in the conceptual model, then by each smoking classification sample. The findings support the conceptual model and provide differences between threats, perceived level of threat and how emotions influence attitude and intentions. The role of the coping response classification is explored establishing how the critical value estimates message acceptance or rejection. Finally the propositions' exploratory hypothesis were summarised to show the structured approach to testing propositions. The next chapter discusses the conceptual model and elaborates on the propositions.

Chapter Six

Discussion and implications of the research

6.1 Introduction

This chapter discusses the research findings. The importance of segmenting the adolescent segment based on smoking classification and the conceptual model are described first. The propositions are then discussed in depth one at a time emphasizing the impact through coping response categories, emotional responses and self-reported future smoking attitude and intentions.

6.2 The importance of segmenting adolescents based on smoking behaviour.

The results provide clear evidence that threat appeal research should be segmented between non-smoking and smoking adolescents early in secondary school. To the best of the author's knowledge, this is the first time 11-13 year old adolescents' responses to social and physical threat appeals have been compared, with no research establishing the differences between smoking classifications. This research proposes recommendations for segmenting exposure to anti-smoking threat appeals between smoking behaviour classifications. This provides public health practitioners with insights when developing materials for campaigns such as the 'smoke free' initiative (PHE 2014) or when commissioning behaviour change programs like ASSIST (Langford *et al.* 2014). Although segmenting observation to advertising is difficult one way to achieve this is including the threat stimulus in paid online advertising. This provides the opportunity to segment observations based on behavioural targeting,

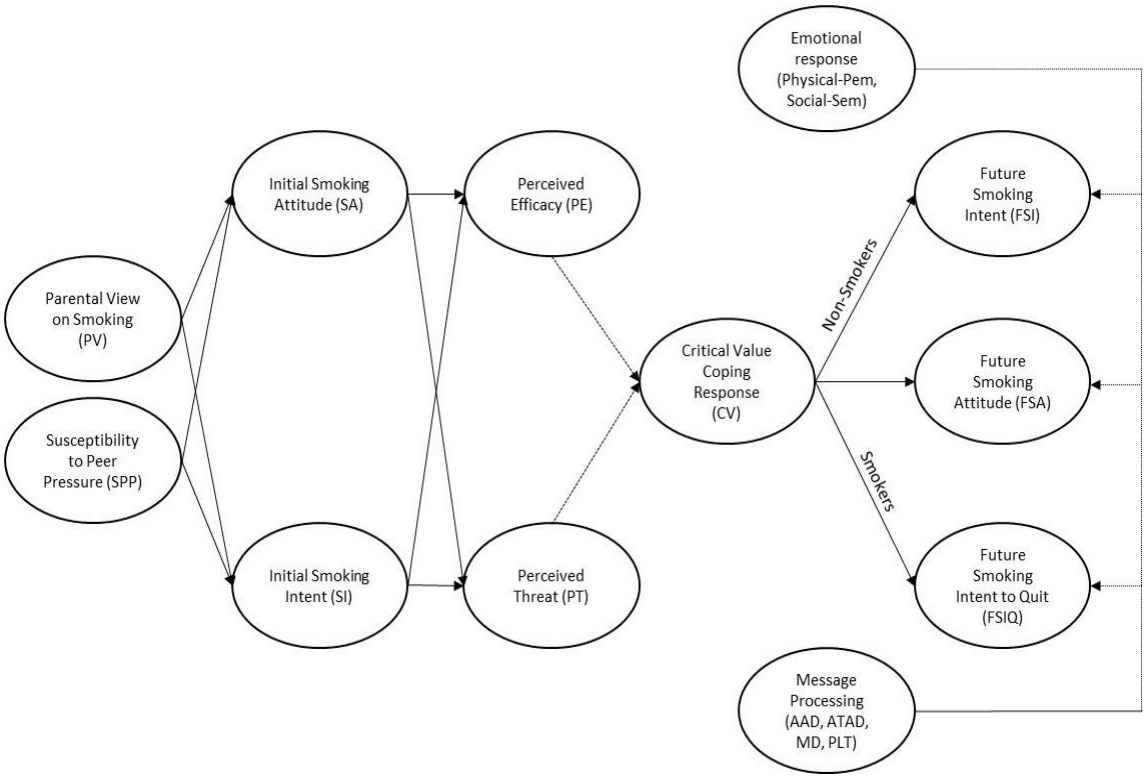
where selection criteria determines who are exposed to the advertisement online using filters including age, gender, interest key words and even previous online behaviours and search terms (Khobzi and Teimourpour 2015). This research addresses gaps in the threat appeal literature and develops self-report scales to obtain social influence and coping response factors among adolescents. The new scales are influenced to health promotion research, threat appeal research, social learning and behavioural change approaches to estimate adolescent responses towards social and physical threat appeals.

6.3 The conceptual model

The conceptual model for estimating adolescents' responses to threat appeals provides an evolved version of the extended parallel processing model. The model takes influence from behaviour change theories, heath models and threat appeal models, providing a model to research how social marketing research influences adolescents (Petty and Cacciopo 1996). The model estimates smoking intent and attitude, taking into account social influence and how coping response influences responses. The model also provides pre and post exposure smoking attitude and intention measures absent from previous threat appeal models. Given the shortage of published work on how health warnings influence adolescents' smoking related attitudes and behavioural responses (Ho 1994; Robinson and Killen 1997; Crawford *et al.* 2002; O'Hegarty *et al.* 2006; White *et al.* 2008), the integration of pre exposure and post exposure smoking behaviour responses with the critical value classification provides an interesting model to estimate responses when planning a behaviour change marketing campaign. The conceptual model is described in Diagram 6.1 which consistently provided a very good level of fit between the data and the model based on fit indexes

that estimate adolescent non-smoker and smoker responses to social and physical threat appeals. The role of social and physical emotional responses and how the coping response classification estimates smoking attitude and intentions is supported.

Diagram 6.1 Full Conceptual Model



The established model proposed by Witte (1992) stipulates a high threat situation causes a physical emotional response that influences behaviour regulation depending on how the coping response being weighted between perceived threat and perceived efficacy. By exploring the critical value coping response classification, an understanding of how the negative critical value of emotion control influences behaviour significantly differently to the positive critical value of danger control is provided for adolescents. Support claims made by Murnaghan and colleagues (2009) that the items estimating the critical value coping response should be assessed as individually which enables campaign evaluation to understand if the communication

elicits increased levels of perceived threat that overpowers the perceived efficacy. This is an interesting and exciting result that needs to be explored even further with different contexts and age samples. Although Witte's model is frequently used in health promotion to understand viewers coping response towards a threat appeal, the model had only been investigated with text based and verbal messages (Wong and Cappella 2009) which is addressed and overcome by the research.

The majority of research on threat appeals has investigated the 'fearful' physical emotional response towards physical threat content that relates to health and death consequences (Henley and Donovan 1999) reducing the generalizability to alternative threat appeal contexts (Siegel and Biener 2000). The reliance that only fearful emotional responses influence behaviour is synonymous with the perceived level of threat as initial research believed the degree of fear equated to the severity and level of the threat (Rogers and Mewborn 1976). This was addressed by La Tour and Rotfeld (1997) who described that the threat is the stimuli and fear is the subsequent emotional response. Although the research models frequently assume that a fearful emotional response is paramount to behaviour change, it was important to investigate how alternative emotional responses influenced behaviour responses in adolescents' who elicit different emotions to different context which is an increasing topic in advertising research (Gropel-Klein 2014). Research has relied mainly on promoting physical emotional responses, which are regarded to be inappropriate for reducing smoking prevalence in adolescence (Strahan *et al.* 2002). The findings will help public health practitioners estimate behaviour change through a segmented and evaluative approach, monitoring how coping response, emotional response and social factors influence self-reported smoking attitudes and smoking intentions.

Acknowledging how health behaviour models influence communications (Marchand 2010) provides an opportunity to enrich threat appeal efficacy and understand coping responses (Tanner 2006). Previous social marketing and behaviour change marketing research has lacked this (Truong 2014), acknowledging that it is important to use theory and integrate aspects of health models to explain influential factors that drive people to practice good behaviours (Ho 1998). Tanner (2006) points out that 'little theoretical development has occurred and very little known about what causes maladaptive coping response and the role of other emotion' (p. 415). Integrating aspects from the social learning theory, the theory of reasoned action, the theory of planned behaviour and influences from threat models and health models evolved the conceptual model which provided greater estimation power on attitude, social influence and self-efficacy's influence on intention, with the latter being shown to have a moderate effect on behaviour (Webb and Sheeran 2006). Theoretical and methodological contributions are made by adapting the model and extending previous scales that were not reliable for adolescents (Michalediou *et al.* 2008; Dickinson and Holmes 2012). The proposed conceptual model provides a significant link between social influence items to estimate smoking intent and smoking attitude, while illustrating how coping response and emotional response influence post exposure self-reported behaviour projections.

6.4 The findings regarding Proposition #1

The first proposition stated that *'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'.* The findings supported the need to gain greater insight to prevent the onset of smoking during adolescence that is highlighted in the smoking behaviour models

(Alabaum *et al.* 2002; Kremers, Mudde and de Vries 2004). There is a particular emphasis in providing methods to reduce adolescent smoking (de Vries *et al.* 2006), that initially take into consideration the role of social influences between samples followed by the differences between emotional response, message processing and coping response.

Social influence between samples

It is rather surprising that the threat appeal models have not included social influence which is regarded central to interventions tailored for adolescents (Ho 1998; Hoving, Reubsaet and de Vries 2007). The findings confirm the assumptions that smokers' have a greater social influence towards smoking consistently having a significantly greater parental view on smoking and a greater susceptibility to peer pressure than non-smokers'. This confirms that social factors estimate smoking attitude, intentions and subsequent behaviour among young adolescents (Aitken and Eadie 1990; Charlton and Blair 1989; Tian, Oei, and Baldwin 1992; Hastings and Aitken 1995; Epstein, Botvin and Diaz 1999; DeLorme, Kreshel and Reid 2003; Leatherdale *et al.* 2005). Campaigns targeting adolescents' that smoke, or experiment should include aspects of social rejection and parental disapproval towards smoking behaviour to counteract the beliefs central to adolescents' cognitive development highlighted in Piaget's theory. These factors are more pertinent to adolescents than physical health based threats that are disregarded by smokers' optimism due to the personal fable that influences false invulnerability beliefs and reduced perception of risk from future orientated health threats.

Smoking behaviour responses between samples

As expected the initial smoking behavioural responses were different between the non-smoker and smoker samples (Ouellette and Wood 1998); with smokers' having a greater smoking attitude and a greater smoking intent than non-smokers' providing support to segment samples to improve reliability of marketing efforts. Responses to physical threats had a significant difference between samples future smoking attitude; increasing smokers' future smoking attitude significantly more than non-smokers'. This provides evidence that physical threats have a significantly greater influence on non-smokers' responses than smokers', with smokers' having greater engagement to social threats. This is based on the view that physical threats influence non-smokers' future smoking attitude significantly more than smokers'. This was expected as physical threats propose longitudinal threats that do not resonate well with smokers' due to optimistic bias (Weinstein 1993). Although negativity bias theory suggests a focus on the negative events will increase involvement (Vaish, Grossmann, and Woodward 2008), the theory suggests that the negative social threat is more relevant for smokers, whereas the physical threat is more engaging for non-smokers. This confirms why each threat requires greater attention and cognitive processing for the independent samples (Peeters and Czapinski 1990). As samples being at alternate stages in the smoking behaviour model (Alabaum *et al.* 2002; Kremers, Mudde and de Vries 2004), the results provides much needed evidence about the different mechanisms that influence responses to marketing that has the ability to prevent onset or promote cessation through social marketing threats.

The importance of the conceptual model shows that perceived threat and perceived efficacy estimate future behaviour which in turn provides support for the coping

response classification. This shows that physical threats promoted an increased future smoking attitude in non-smokers representing a maladaptive coping response. The behavioural responses to social threats were not significantly different between samples showing that social threats are generalizable across smoking classification samples.

Emotion response between samples

The emotional response was significantly different between samples, with non-smokers' having a significantly greater physical emotional response to both threats, whereas smokers' had a significantly greater social emotional response towards only physical threats. Both emotional responses towards physical threats significantly influenced post exposure responses for both samples. This provides evidence that the emotional response to threat appeals does not only concern the physical emotional cluster, including fear, disgust and sadness, but also the social emotions of guilt, shame and embarrassment. It is important to acknowledge that smokers' eliciting social, self-conscious emotions may catalyse reflection upon their own behaviour (Crozier 1998), which can lead to pro-social and cooperative behaviours (Ketelaar and Tung 2003) which were not previously captured by threat appeals models due to the limited primary focus on fearful emotional responses to physical health threat appeals.

Although non-smokers' had a greater physical emotional response to both threats, the relationship between physical emotional response and future smoking attitude was significantly different between samples; reducing smokers' future smoking attitude and hence representing a maladaptive coping response in non-smokers. It is expected that physical threats cause a greater involvement due to the realistic content (Smith

and Stutts 2003; Henley and Donovan 2003). However, the increased physical emotional response had a detrimental effect on non-smokers behaviour and the desired effect on smokers. This shows how the conceptual model is able to estimate response providing essential information for health practitioners.

These findings demonstrate that non-smokers' and smokers' have significantly different emotional responses to threat appeals, with smokers' eliciting social emotions; whereas non-smokers' feeling physical emotions. This means that one threat appeal stimuli may be more linked to one emotion than another for either segment (Cisler, Olatunji, Lohr and Williams 2009) which highlights the necessity of context specific research (Rotfeld 1988). The role of these emotions on behaviour will be further discussed to provide an understanding of how the emotions influence adolescents' responses to advertisements (Vanhamme and Chiu 2008) and how the critical value coping response influences emotional response and behaviour responses.

Message processing between samples

The message processing was significantly different between samples. Non-smokers' had a significantly greater attitude and attention to the advert towards both threats, whereas smokers' had significantly greater message derogation towards both threats. These results are expected due to a greater depth of processing from product involvement (Cacioppo *et al.* 1986) and provide evidence that smokers' will pay significantly less attention and have less favourable attitude towards anti-smoking threat appeals. Smokers' optimism reduces involvement due to optimistic bias and negligence that the threats are not applicable due to a perceived invulnerability to smoking threats (Weinstein 1993).

The optimistic bias concept is further expressed as smokers' had a significantly lower perceived level of threat towards both threats compared to non-smokers'. The high level of perceived threat is shown to influence responses (Hunt *et al.* 1991). This could be an additional reason why non-smokers' had a greater emotional and message processing while expressing maladaptive coping responses, which in turn influenced an increased future smoking attitude. This is because the threat appeal theories stipulate that the perceived threat must not outweigh the perceived efficacy of adopting the behaviour. In order to conceptualise the difference between smokers' and non-smokers' response regulation, the critical value coping response classification scale provides a numerical value. This was used to assess if the observer was in maladaptive coping response or an adaptive coping response, which is dependent on level of perceived efficacy and perceived threat. As expected smokers' perceived efficacy towards smoking was found to be significantly greater than non-smokers', which resulted in a significantly lower future smoking attitude. This proves that optimistic bias theory illustrates how smokers' underestimate the risk and the danger of smoking (Leventhal *et al.* 1987; Cecil *et al.* 1996; Arnett 2000; Chaplin 2001; Zollo 2004; Ruiter *et al.* 2005), which is due to the critical value classification showed that non-smokers' had a significantly greater critical value towards both threats compared to smokers'. This shows that smokers' consistently had an increased maladaptive coping response that they would disregard the threat appeal which is due to optimistic bias, risk assessment and greater perceived quit efficacy than adults smokers', thus underestimating the probability of experiencing a negative event (Weinstein 1980; Taylor and Brown 1988; Arnett 2000; Chaplin 2001; Ruiter *et al.* 2005; Erceg-Hurn and Stead 2011).

6.5 The findings regarding Proposition #2

The second proposition that *'Post exposure behavioural responses will be significantly different between threats'* provided insights into the factors that contribute to the effectiveness of adolescent smoking prevention campaigns that are of critical importance to prevent tobacco use (Winkleby *et al.* 1993; Elders *et al.* 1994; Samu and Bhatnagar 2008). Although the efficacy of health related threat appeals are debatable (Witte 1992; Dillard 1994; LaTour, Snipes and Bliss 1996; Ruiter, Abraham and Kok 2001), research has focused primarily on health related physical threats. The over reliance is due to physical threats being regarded to influence behaviour due to the belief they are more influential, realistic and have persuasive characteristics (Smith and Stutts 2003; Henley and Donovan 2003). Although recent research has challenged the paradigm and championed the idea that social threats are influential with adolescents (La Tour and Rotfeld 1997; Laroche *et al.* 2001; Dickinson and Holmes 2008), the research provides valuable insights into new content supporting the rise of research investigating social and physical threats (Laroche *et al.* 2001). A comparative analysis between social threats and physical threats will also provide evidence to fulfil the divide between threats (Sternthal and Craig 1974), which is achieved by comparing adolescents' responses differ to social threats and physical threats (La Tour and Rotfeld 1997; Dickinson and Holmes 2008).

The influence of type of threat on future smoking responses

The conceptual model provided a very good model fit that significantly estimated future smoking attitude, future smoking intent and intent to quit to both threat classifications establishing significant differences. Weinstein's (1980) smokers'

optimism is proven with adolescents, as smokers' perceived threat response towards physical threats did not significantly estimate future smoking attitude showing smokers' completely disregard the perceived threat of only physical threat appeals.

The relationship between non-smokers' smoking attitude and future smoking attitude was shown to be significantly different depending on threat observed, concluding witnessing a physical threat had a significantly greater future smoking attitude than witnessing a social threat. Although the finding is only valid for the non-smoker sample, the findings that physical threats were associated to a significantly greater future smoking attitude prove expectations that physical threats are inappropriate for adolescents' that influences a maladaptive coping response (Frankenberger and Sukhdial 1994).

Non-smokers' expressed a significantly reduced future smoking attitude and future smoking intent towards physical threats than social threats when having high levels of perceived efficacy, showing that non-smokers' perceived efficacy towards physical threats estimates a reduced behaviour and can 'control the danger and control the fear about the threat' (Witte and Allen 2000). This supports claims that physical threats have a greater influence on behaviour than social threats (Uusitalo and Niemel 2008). Considering the fear-drive model's assumptions that threats are projections in the future, with lifestyle changes being subject to optimistic bias (Thirlaway and Upton 2009), it is important to promote a high efficacious response to influence an adaptive coping response, accept the threat and reduce behaviour described in the threat appeal.

Although high efficacious non-smoker responses to physical threats influenced a reduced future smoking attitude, smokers' perceived threat responses to social threats significantly influenced a reduced future smoking attitude. This concludes that

smokers' perceived threat and probability that harm will occur was greater to a social threat than physical threat which confirms initial assumptions. Considering that perceived threat is seen to be key to persuasive advertising (Witte 1994), campaigns targeting smoking adolescents should emphasise the perceived threat from a social threat rather than physical threat that is susceptible to smokers' optimism. The results provide useful and striking evidence that perceived efficacy and perceived threat should be evaluated as independent constructs in the model as well as a holistic factor (Murnaghan *et al.* 2009).

The influence of emotional responses on behaviour between threats

Misclassification occurs as threat appeals are often described as fear appeals which lead the term 'threat appeal' to be synonymous with the physical emotion of fear. This is why threat appeals are expected to promote physical emotions and consider fear as the prominent emotion (Donovan and Henley 1997) that acts as a catalyst to motivate and influence actions (Witte and Allen 2000) traditionally through physical health threat content. Threat appeals should use a selection of emotions that can affect the viewer's response (MacInnis and Stayman 1993). The role of other emotional responses towards threat appeals provide innovative findings and confirm initial assumptions that social emotions are promoted to threat appeals (Henley and Donovan 1999).

Factorial analysis proved that fear, disgust and sadness were consistently clustered as physical emotions; whereas shame, guilt and embarrassment were categorised as social emotions. The results consistently show that physical threat appeals promote a cluster of physical emotions, rather than just fear, confirming that people experience a

mixture of emotions that synergistically influence behaviour (Zelenski and Larsen 2000). One explanation for smokers' having self-conscious social emotional responses to physical threats is due to feelings regarding self-reflection and self-harm (Crozier 1998; Tangney and Fischer 1995; Lewis 2003), which are regarded paramount to social acceptance and behavioural change (Tangney, Stuewig and Mashek 2007). This confirms assumptions that the 'fear or the threat' of social disgrace is an effective and strong appeal to be elicited among adolescents (LaTour and Rotfeld 1997).

The relationship between the physical emotional response and future smoking attitude was significantly different between threats. The direction of the relationship was different for the non-smoker than smoker samples:

Non-smokers' physical emotional response towards physical threats significantly influenced an increased future smoking attitude supporting that highly fearful or physical emotional appeals are counterproductive and can cause a maladaptive coping response to disregard the message and threat (Hovland, Janis and Kelley 1953; Janis 1967; Leventhal 1970; LaTour and Zahra 1989; Hyman and Tansey 1990; Witte 1994; Manyiwa and Brennan 2012). Considering Timmers and van der Wijst (2007) concluded that promoting genuine fearful responses did not result in more effective threat appeals, the role of high physical emotions needs to be carefully investigated when implemented. Especially as the boomerang effect is caused by too great an emotional response that promotes a maladaptive coping response and counteracts the marketing campaigns objective of positive behavioural change.

Smokers' physical emotional response towards social threats significantly influenced a reduced future smoking attitude showing that highly physical emotional responses

influenced a greater attitude change for smokers' supporting Montazeri and McCurran's (1997) assumptions. Both emotions influenced smokers' future smoking intent to quit significantly differently between threats. The physical emotional response towards physical threats significantly influenced an increased future smoking intent to quit compared to social threats, whereas the social emotional response towards social threats significantly influenced an increased future smoking intent to quit compared to physical threats. This shows that a greater emotional response associated with the threat appeal context influenced an adaptive coping response among smokers' accepting the threat and changing attitude and intentions.

The results suggest that high physical emotions to physical threats influence a maladaptive behavioural response for non-smokers' smoking attitude, whereas a high physical emotional response to both threats influences an adaptive coping response for smokers' smoking attitude and both emotional responses to both threats influence future smoking intent to quit. This provides a contribution to the inconsistencies in the threat appeal literature, disproving the view that smokers' have a maladaptive coping response to witnessing a physical threat (Harris *et al.* 2007).

The influence of message processing on behaviour between threats

The message processing results provided support for the relationship that physical threats are more realistic and persuasive than social threats (Henley and Donovan 2003; Smith and Stutts 2003; Dickinson and Holmes 2008), with the results concluding that the message processing responses were significantly greater to the physical threats. The results showed that physical threats produced a significantly greater attitude towards the advert compared to social threats for both samples, but

only smokers' attention to the physical threat appeals was significantly greater than social threats. This shows that non-smokers' paid the same amount of attention to both threats and provides evidence those adolescent smokers' pay a greater attention towards physical threats than social threats. The perceived level of threat was significantly greater towards physical threats compared to social threats suggesting that physical threats promote a greater message processing and perceived level of threat confirming the initial assumptions and support that physical threats are more persuasive (Smith and Stutts 2003; Henley and Donovan 2003).

6.6 The findings regarding Proposition #3

The third proposition that *'The perceived level of threat will significantly influence post exposure responses to each threat condition'* confirms that adolescents' have greater engagement when the perceived level of threat is greater, providing evidence about the debated strength of threat appeals, persuasiveness and effectiveness (Manyiwa and Brennan 2012). Boster and Mongeau (1984) noted, if the strongest level of threat appeal is most persuasive, creating the greatest response; there is no need to use lower levels being less persuasive. The role of the perceived level of threat was confirmed for adolescent non-smokers' and smokers' concerning different threat appeals. No previous research has investigated how the perceived level of threat regarding a social threat influences behaviour compared to a physical threat.

Non-smokers' responses to physical threats concluded that those with a high perceived level of threat were related to a significantly lower future smoking intent smoking attitude than those with a low perceived level of threat, confirming initial assumptions that the highest perceived level of threat will have the greatest arousal

resulting in an adaptive coping response and reduce the problematic behaviour (Janis and Feshbach 1953; Witte and Allen 2000). As expected there were no differences for social threats or smoker responses to both threats due to optimistic bias and involvement factors. Although this provides support for the initial assumptions, the fact that only the higher level of threat towards physical threats influenced a significant behavioural difference shows further research is needed. The other content is inconclusive with support for a particular level of threat prevalent in the literature (Snipes *et al.* 1999; Rossiter and Thornton 2004; Rossiter and Jones 2004). This is because the results only support responses to physical threats which have traditionally championed the assumption that the greater the perceived threat to physical threats strengthens intentions to promote an adaptive coping response (Leventhal 1970; Rogers 1975, Sutton 1982; Rippetoe and Rogers 1987) which is not fully supported.

6.7 The findings regarding Proposition #4

The fourth proposition that *'The critical value will significantly influence post exposure behavioural responses to each threat condition'* shows that the coping response classification provides a valuable insight about accepting or avoiding the threat. The role of the critical value provides an understanding of how behavioural responses depend on the critical value (Witte 1990). The critical value classifies responses as either an adaptive coping response being in danger control; or a maladaptive coping response being in emotion control. The efficacy of the critical value classification estimating responses was assessed by initially discussing the differences between critical values responses, followed by the emotional responses and message processing items.

Effect of the critical value responses

The critical value influences post exposure behaviours significantly differently between the non-smoker and smoker samples. The critical value influenced a reduced future smoking intent and future smoking attitude for non-smokers' responses towards physical threats; but also significantly influences an increased future smoking intent to quit for smokers' responses towards social threats. This illustrates an adaptive coping response and concludes that non-smokers' behaviour was influenced by physical threats, confirming the belief that non-smoking adolescents' are responsive to messages about health concerns of smoking (Biener *et al.* 2004; Terry-McElrath *et al.* 2005). The result provides evidence that adolescent smokers' in particular are influenced by social threats (Grover and Kamins 2008; Ho 2008). Although both threats are 'direct, realistic, factual and show strong future warnings' (Crawford *et al.* 2002), the results provide evidence about how to create a threat appeal that influences an adaptive coping response. The results show that a positive critical value influences an adaptive coping response supporting Witte's (1994) critical value assumption. This provides evidence that the conceptual model is applicable to pictorial images and text messages to different threats with alternative negative emotional responses that were limitation to the empirical testing of the extended parallel processing model (Wong and Cappella 2009).

Considering that Witte (1992) suggested a negative critical value influences a maladaptive coping response, results provide evidence of the boomerang effect. The critical value significantly influenced future smoking attitude for non-smokers'. Those in danger control had a significantly greater future smoking attitude than those in emotion control to social threats and both samples towards physical threats

representing the expected maladaptive coping response. The conceptual model showed that the self-efficacy dimension of critical value coping response influenced motivation and behaviour intentions as described by DeVries and colleagues (1988). The results confirm the importance of the critical value coping response being used in health promotion (Heale and Griffin 2008), providing evidence to overcome the lack of research into the role of self-efficacy estimating responses to anti-smoking advertising (Flay 1987; Wakefield *et al.* 2003). Bagozzi, Yi and Baumgartner (1990) stated that the role of attitude influences behaviour based on the levels of efficacy, with intentions mediating the relationship when low efficacy (high effort), whereas attitude has a significant impact when high efficacy (low effort). This confirms the importance of investigating the attitude-behaviour relationship alongside the intention-behaviour relationship with different segments and with differing levels of perceived efficacy.

The full model is reliable and the perceived threat and perceived efficacy that form the critical value coping response significantly influenced future smoking responses. This shows that non-smokers' and smokers' coping responses were influenced by different threats. However, future smoking intent to quit responses towards social threats increased when in danger control and future smoking intent responses towards physical threats reduced when in danger control. This shows social threats influence an adaptive coping response whereas physical threats influence a maladaptive coping response.

To understand how the critical value classification influences behaviour the relationship between pre exposure smoking attitude and post exposure future smoking attitude towards different threats was analysed. The critical value classification influence significant differences for non-smokers towards physical threats and for

smokers towards social threats, providing evidence about how behavioural responses differ depending on coping responses (Witte 1992). Classifying respondents by critical value, either being in emotion or danger control, describes witnessing a physical threat that influences a danger control response had a reduced future smoking attitude and a reduced future smoking intent. This supports the theory that high an emotional response influences an adaptive coping response with those in danger control having a significantly different future smoking attitude and future smoking intent than those in emotion control to physical threats. As expected those in emotion control disregarded the threat and had a greater future smoking attitude and intent, with those in danger control have a significantly reduced future smoking attitude and intent to social threat. This proves the critical value theory to social threats that those in danger control have a reduced future smoking attitude and future smoking intent, and those in emotion control have an increased smoking intent. Smokers' physical emotion response while in danger control towards both threats influenced a significantly increased future smoking intent to quit; showing those in danger control had an adaptive coping response.

As expected the perceived level of threat was significantly different for non-smokers between critical value classifications, being greater in emotion control towards both threats than being in danger control. No differences for smokers were observed which could be due to optimistic bias to disregard the threat (Weinstein 1980).

Emotion response and critical value

An emotional response is regarded to enable and to overcome different situations through a state called 'action readiness' (Fridja *et al.* 1989). This is an aspect of

emotion control which Witte (1992) initially termed ‘fear control’, suggesting that an increased emotional response, primarily fear, causes one to try to overcome the emotion elicited rather than deal with the threat. Threat appeals traditionally assumed that a greater level of threat equates to a greater level of emotional response which has the greatest influence on behavioural responses. Assessing responses based on critical value coping response classification provided insights into the perceived efficacy and perceived threat relationship with emotional responses. The critical value only significantly influenced non-smokers physical emotion response towards physical threat, as expected being significantly lower for those in danger control than emotion control. With no other significant relationships this confirms Witte’s (1992) critical value classification assumptions that a strong physically threatening emotional response towards a physical threat regulates a coping response. This re-enforces the importance of including the cluster of physical emotions in the conceptual model. This result shows the importance of research integrating both clusters of emotions into the model to understand how different emotions influence post-exposure responses to understand how emotions interact with message features to influence behaviour intentions (Aaker and Williams 1998; Maheswaran and Chen 2006).

Message processing and critical value

The critical value was shown to influence message processing. The attitude and attention towards the advert was significantly lower for non-smokers’ in danger control than emotion control from both threats, but only attitude towards the advert was lower for smokers’ witnessing a physical threat. This shows that non-smokers’ in danger control pay greater attention and attitude towards both threats, which may be due to smokers’ not engaging with the adverts due to optimistic bias. This describes

that an adaptive coping response will have greater message processing (Manyiwa and Brennan 2012) and overcomes the lack of empirical evidence describing which type of threat promotes higher levels of message acceptance (Agrawal *et al.* 2007; Dickinson and Holmes 2008).

6.8 The findings regarding Proposition #5

The fifth proposition that; *'Social factors will significantly influence smoking beliefs and attitudes'* was provided. The social factors had a positive influence on smoking behaviours as described by Tian, Oei, and Baldwin (1992). Considering intentions and coping responses are learned through modelling and social reinforcement (Thirlaway and Upton 2005), the importance of prevention programs acknowledging peer and parental influence is consistently recommended (O'Loughlin *et al.* 1998; Azevedo *et al.* 1999). Incorporating social influence at the initial stage of the model provides a holistic view on how behaviours are influenced by social environment and prior experiences (Griffin and O'Cass 2004). The conceptual model included factors creating an adolescents' key reference group that holds the largest determinant on adolescents' behaviour (White 1987). The conceptual model produced reliable goodness of fit indices, with both social factors estimating initial smoking attitude, intent and were significantly correlated to smoking behaviour classification. This confirms parents' attitudes towards risky behaviour and peer pressure are powerful predictors of smoking behavioural responses (Urberg *et al.* 1990; Oman *et al.* 2004). These results prove the importance of acknowledging social influential facets when creating a campaign to prevent smoking initiation (Johnson 1991; Chang *et al.* 2006).

Innovative findings emerged from analysis of the non-smoker and smoker samples, showing that smokers' have a significantly greater parental view on smoking and susceptibly to peer pressure than non-smokers'. This result provides evidence to support views that adolescents' are more likely to experiment with smoking if encouraged by pro smoking or permissive attitudes of parents, peers and siblings (Charlton and Blair 1989; Aitken and Eadie 1990; Hastings and Aitken 1995; Epstein *et al.* 1999; Leatherdale *et al.* 2005). This is an important finding showing that non-smokers' and smokers' have significantly different social factors that influence smoking behaviour. Thus, suggesting the importance of including the social factors that estimate smoking behaviour in the threat appeal model that ultimately showed the greater the social factors the greater the smoking intent and attitude.

6.9 The findings regarding Proposition #6

The final proposition is that; *'The type of emotional response will influence post exposure response'* which investigated how emotional responses influenced responses by directing attention to the emotion eliciting event or stimuli, which is regarded to motivate, persuade and influences attitude and behaviours (Johnson-Laird and Oatley 1992; Bagozzi, Gopinath and Nyer 1999; Andrade and Cohen 2007). The functionalist perspective proposes that emotions influence a multitude of outcomes (Lench *et al.* 2011), with behavioural change being a central focus of various pieces of academic research (Lerner and Keltner 2000). The role that the two clusters of emotions have upon influencing behaviour provides insight into the adaptive and maladaptive capabilities of using emotional response to influence behaviour from social and physical threat appeals.

The clustered emotional response findings

The models including physical or social emotional responses have reliable fit indices with independent emotional clusters estimating post exposure smoking responses.

The influence of physical emotional response upon responses differs depending on threat witnessed. Towards physical threats, non-smokers' physical emotional response significantly influenced an increased future smoking attitude that was significantly different to responses to social threats. Whereas smokers' physical emotional responses towards social threats significantly influences an increased future smoking attitude that was significantly different to physical threat responses. This consistently proves Witte's (1990) assumption that greater emotional response alone influences a maladaptive coping response. This is further expressed with the smoker social emotional response towards social threats significantly influencing a reduced future smoking intent to quit that was significantly different to physical threats. This confirms the need to use the conceptual model to understand how emotional responses and coping responses influence self-reported prospective attitude and intention outcomes. In contrast the physical emotional response towards physical threats significantly influenced an increased future smoking intent to quit for smokers' that was significantly different to social threats. This shows that the greater emotional response of both clusters influences adolescents' future smoking attitude and future smoking intent to quit, confirming King and Reid's' (1989) assumptions that physical emotional responses influence behavioural responses; such as smoking attitude, but also that social emotions are influential. Although the physical emotional response to physical threats influenced a maladaptive response for the smoking attitude, it significantly increased future smoking intent to quit. Further analysis assesses the

emotional response relationship with the critical value classification as simply stating the greater emotions influenced a behavioural response does not take into account coping response that regulates behaviour based on levels of perceived efficacy and perceived threat.

Emotional response and critical value categories

A greater emotional response towards physical threats significantly influenced a greater future smoking attitude and intent for non-smokers'. This provides evidence that non-smoking threat appeals should be approached with caution as campaigns can backfire (Wolburg 2006). Ultimately the emotional responses elicited should not be too strong which overpower the perceived efficacy and ability to process the message properly, which results in a maladaptive coping response causing the boomerang effect where the message is avoided and content disregarded.

The analysis shows that the emotions influence the critical value coping response classification hypothesised by Witte (1992). Non-smokers' physical emotional response towards social threats showed that those in emotion control reported an increased future smoking intent, whereas those in danger control expressed a reduced future smoking intent. This shows that the critical value classification assumptions correctly estimated self-reported attitude and intent, but further that social emotion responses have the potential to reduce behavioural intentions which had not previously been investigated.

The analysis provided results between critical value classifications with the physical emotional response to social threats influencing an increasing future smoking intent to quit for those in danger control showing an adaptive coping response. Other findings

for those in emotion control showed that physical emotions towards physical threats increased future smoking attitude; social emotions towards social threats reduced future intent to quit and social emotional response towards physical threats significantly influenced greater future smoking attitude. This showed the expected maladaptive coping response for being in the emotion control classification.

This proves the need for increased research into self-conscious emotions (Tracy, Robins, and Tangney 2007), which provides insight into how adolescents' react to threats influence peer disapproval, rejection or criticism from others (Lewis 1971; Scheff and Retzinger 1991; Ferguson *et al.* 1999; Leary 2000). As a social emotional response to physical threats is not the initial expectation from the literature, it shows that non-smokers' feeling shame, embarrassment and guilt confirming the experiencing a mixture of emotions together (Zelenski and Larsen 2000), not just fear.

These results show that the two clusters of emotional responses towards both threats influenced smoking behavioural responses, although as expected the results were inconsistent between samples. To gain a greater insight into the role of how the emotions influenced behaviour, the relationship between emotional response and future smoking intent and future smoking attitude between critical value classifications provided confirmation of the conceptual model's adapted coping response scales classification.

Being in danger control confirmed the promotion of an adaptive coping response, proving that the model correctly classified those having both social and physical emotional response with:

- Non-smokers' physical emotional response towards social threats in danger control reduced future smoking intent and reduced future smoking attitude.

- Smokers' physical emotional response towards physical threats in danger control significantly increased future smoking intent to quit.

Being in emotion control confirmed the promotion of a maladaptive coping response, proving that the model correctly classified those having both social and physical emotional response with:

- Non-smokers' physical emotional response towards social threats in emotion control increased future smoking intent
- Non-smokers' social emotional response towards social threats in emotion control significantly increased future smoking intent.
- Non-smokers' social emotional response towards physical threats in emotion control significantly increased future smoking intent.

6.10 Summary

This chapter outlined the conceptual model and discussed the results of the six research propositions contrasting against previous findings. The conceptual model was empirically validated providing support for the model to be tested with adolescent threat appeals that utilise the coping response to understand behaviour response to a threat appeal. The literature emphasised the findings between non-smokers' and smokers' responses confirming the need to segment anti-smoking threat appeal campaigns. The significant differences between threat appeal categories illustrated the importance of investigating social threats further to increase behaviour change efficacy. The next chapter summarises our findings while highlighting the contributions, recommendations and future research avenues.

Chapter Seven

Conclusion and Suggestions

7.1 Introduction

This chapter consists of two sections. In section one the main findings are summarised in two categories, namely a theoretical perspective and a practical contribution. Section two outlines some practical though challenging research avenues that are believed to be worth exploring in the future while acknowledging the limitations.

7.2 Conclusion

The thesis uncovers a multitude of contributions regarding adolescents' responses to social marketing threat appeals. The results provide innovative findings about how public health practitioners can use threat appeal theory to evaluate and develop a social marketing campaign during the planning stage. This provides clear guidelines to increase the success of a campaign targeted towards either influencing smoking attitudes or smoking intentions for non-smoking adolescents or smoking adolescents. Previous studies have suggested that social threat appeals are under researched and provide an opportunity to interact with young adolescents (Schoenbachler and Whittler 1996; LaTour and Rotfeld 1997). This thesis aims to close the gap by providing clear findings about how adolescent non-smokers' and smokers' respond to different threat appeals not tested comparatively before. This study demonstrates that social threats are ineffective with non-smokers but influence smokers. The research models provide an opportunity to monitor the boomerang effect that creates an

unwanted, dismissive response from observation (Wolburg 2006) and emphasizes the importance of targeting specific segments based on smoking classification to reduce the maladaptive coping responses among adolescents. The roles of social emotions are also investigated alongside the traditional physical emotional responses towards physical threats and social threats as suggested by Henley and Donovan (2003). Research traditionally includes young adult smokers or older adolescent smokers (Pechmann *et al.* 2003), but to the best of the author's knowledge, none has compared the views of young smoking and non-smoking adolescents' attitudes and intentions towards smoking. In conclusion, the study provides an important extension to Witte's (1990) dated Extended Parallel Processing model, utilising smoking behaviour models segmentation approach (Kremers, Mudde and de Vries 2004) while including coping response variables developed from health models (Glanz and Yang 1996), with an emphasis on how adolescents' smoking attitudes, intentions and even behaviours are influenced by social learning theory (Bandura 1969). The contributions of this research are summarised under the following two categories, namely theoretical and practical contributions.

Theoretical Contribution

This research contributes to existing knowledge by showing how the mechanisms of coping response classification can regulate and estimate responses to physical and social threat appeals. The methodological issues relating to scale development and the role of acknowledging only fear as an emotional response in the threat appeal models were overcome by investigating physical as well as social clusters of emotional responses to generate more robust findings and provide much needed mixed emotion

response findings (Gropell-Klein 2014). The conceptual model extended previous threat appeal models to integrate aspects of social learning theory and the health models to the threat appeal domain. The development of scales provided new research tools to analyse adolescents' coping responses towards threat appeals. The inclusion of social influence factors to the model provided a greater understanding of the influential factors upon adolescents' smoking attitude, intent and smoking behaviours. The research highlighted the importance of including physical and social threat appeals in social marketing campaigns depending on segment behaviours. The necessity of segmenting the population of adolescents into non-smoking and smoking samples was emphasised by the significantly different responses to both threat appeals. Thus, the need for clear audience segmentation when creating social marketing campaigns emerged from the findings of this thesis. The importance of including a cluster of emotional responses was further discussed as the traditional fearful emotional response was clustered within the physical emotional response factor which influenced responses to both threats appeal. Innovative findings regarding social emotions were shown to be an important cluster of emotions to influence specifically smokers' responses that influenced coping response classification.

Practical Contribution

The literature rightly suggests that the priority of public health practitioners and policies is to reduce the amount of new smokers, rather than stopping those who already smoke (Hu *et al.* 1998). This is because reducing new smokers from the 10-14 year old cohort would reduce the number of young people becoming established

smokers (Choi *et al.* 2001). This emphasises the need to influence adolescents' while in an unmotivated state regarding plans for smoking and before they move from pre-contemplation to experimentation with tobacco smoking (Alabaum *et al.* 2002; Kremers, Mudde and DeVries 2004). This research provides evidence supporting the need to target adolescent non-smokers and provides insights into the methods that can aid the increased future smoking intent to quit among young adolescent smokers who would not yet have a well-established habit. This further proves that social marketing is able to influence behaviour change and contribute to tackling one of society's biggest health problems in adolescent smoking rates (Petty and Cacioppo 1996).

This research provides clear findings that social threats and physical threats have the ability to influence adolescent non-smokers and smokers intentions and attitudes. The role of physical emotions plays a crucial role in influencing adolescent smokers' responses to social threat appeals, whereas the greater level of threat recognised by non-smokers' was highly correlated to increased physical emotional responses. As expected, a greater physical emotional response had a detrimental effect on behaviour and caused a maladaptive coping response. This provides valuable evidence that, although the physical emotional response is the most elicited among adolescents, it is a response valid for social and physical threats, but must be evaluated regarding the subsequent coping response. This research provides important findings showing that smokers' are more influenced by social threats, whereas non-smokers' have a greater interaction with physical threats. This provides an important contribution that can enrich anti-smoking campaigns directed at adolescents' experimenting with smoking. The adapted model integrates aspects not previously used to estimate adolescents' responses to threat appeals and provides evidence that a cluster of physical emotions influence responses, rather than just one 'fearful' response. The introduction of social

influence scales shows the importance of estimating adolescents' peer and parental influence on their smoking responses. The model can be used to estimate how adolescents' attitude and intentions alter from observing either threat appeal using the critical response categories to evaluate whether the threat influences an adaptive or maladaptive coping response.

Practitioner Recommendations for Non-smoker social marketing campaigns

Anti-smoking threat appeals designed for non-smoking adolescents should include a physical threat appeal and increase their confidence that they can stay abstinent from smoking, rather than trying to scare them with a strong physical emotional response. It is essential that the viewer stays in the danger control critical response, because once they progress into the emotion control category adolescent non-smokers' elicited a maladaptive coping response. The threat appeals must empower the adolescent non-smokers' to take control of their behaviour and avoid the physical threat without being scared by too strong of a physical emotional response which is ultimately damaging and causes a maladaptive coping response, creating a boomerang effect thus ignore the threat and in the worst case primed to experiment with the behaviour.

Practitioner Recommendations Smoker social marketing campaigns

Anti-smoking threat appeals designed for smoking adolescents should include a social threat appeal and increase their perceived threat of the socially threatening consequences of the behaviour. Both emotion clusters contribute to behaviour illustrating peer rejection, with the physical emotional response influencing an adaptive coping response influencing self-reported smoking responses, increasing intent to quit, while reducing attitude. This is only achieved by ensuring the

adolescent smoker is in the danger control category meaning the social threat appeal should not be too threatening and provide an efficacious message that the smokers' can relate with, thus empower them to reduce the physical emotion towards peer rejection from smoking and provide them with the opportunity to use social influence as a way to promote cessation and increase adolescents to stop smoking early on.

7.3 Research avenues and limitations

The research provided numerous opportunities for future research. Initially overcoming the limitations would provide a number of opportunities to strengthen the rigor of further research. Going beyond improving the study efficacy, there are a number of opportunities to expand research to better influence adolescent behaviours.

Empirical longitudinal study

The application of a theoretical study to influence actual behaviour is heavily debated, but provides the initial groundwork for further research. Limitations must be acknowledged when using conceptual models; such as they are often theory based and not empirically tested, with model testing being 'a tentative and imperfect picture of reality' (Bagozzi 1984, p. 26). Through obtaining pre and post behaviour provides greater implications from the research, but this is still based on relationship between variables that do not fully equate to causality. Webb and Sheeran (2006) stated how numerous theories from health to psychology assume that intentions cause behaviour. However it should be noted that the evidence is frequented with correlational studies that do not provide clear conclusion about the causal influence of intentions on behaviour as correlational designs are subject to 'third variable problem' or

'spuriousness' which is where an unmeasured variable potentially influences both intention and behaviour (Kenny 1979; Mauro 1990; Webb and Sheeran 2006). There are two further limitations when evaluating causation from studies based on random controlled trials that they do not directly collect intentions, and secondly do not provide insight into whether changing intentions actually changed behaviour (Webb and Sheeran 2006). Through running a longitudinal study as adolescents' progress though secondary school from year 7 onwards to year 11, with numerous threat manipulations and reporting tests would provide real behaviour change implications.

Self-reported behaviour measures

Although self-reports are regarded to overestimate adherence compared to other assessment methods, most research concludes that self-reports show moderate correspondence to other adherence methods (Stirratt *et al.* 2015). Limitations must be acknowledged about responses collected through self-reported behaviour scales that have the possibility for participants to answer the questionnaire inaccurately and with a bias. The results often suffer from issues incurred by other measurement methods including anchoring effects, primacy and recency effects, time pressure and consistency motivation (Paulhus and Vazire 2009). Ultimately participants' may misreport their behaviour and intentions to what they think the research would expect to obtain, this raises issues including consistency seeking, self-enhancement and self-presentation (Robins and John 1997). This is a common pitfall of self-reported behaviour, but was the only method available to sample such a large population of adolescents over a short period. The control of the threat appeal observed was managed by exposing groups of adolescents' to certain threat appeals to minimise exposure influence. There are other responses biases that must be acknowledged

including pattern responses, random responses and inconsistent responding (Paulhus 1991) including constraints of self-knowledge, self-description and cultural limitations (Paulhus and Vazire 2009). Overall, the relation between self-reports and behaviour tends to be modest (Meyer *et al.*, 2001; Vazire, 2006), with some research stating self-behaviour convergence is higher for affect-related traits (Spain, Eaton, and Funder, 2000) neutral behaviours (Gosling, John, Craik, and Robins, 1998). This shows how smoking behaviour may provide different reports to other health contexts such as healthy eating or flu vaccinations.

The quality of self-report adherence measures may be enhanced with corroboration with alternative assessment methods (Paulhus and Vazire 2009) through using technologic delivery (Stirratt *et al.* 2015) or alternative scales such as using pictures or voice over calls (Kuijpers *et al.* 2014) to obtain more efficacious self-reported behaviours. In the future, smaller samples could be analysed using greater technology tools such as eye tracking software, temperature response rates or biological sampling to measure carbon monoxide rates pre and post exposure. This would have synergies with a longitudinal study that would overcome the time restraint of the PhD data collection. This limitation meant the use self-reported behavioural measures were evaluated on the same day as witnessing the threat appeal, but was the only way to obtain data due to sampling, data monitoring and data collection issues with such a large sample of young adolescents in a school setting.

Coping response implications

Further research into the role of the coping response within the model would provide insight into how the response regulates self-reported behaviour. To further test the causal impact of intention experimental manipulations should be considered (Webb

and Sheeran 2006) that could draw upon the development of Rimal's (2000) quadrant coping response classification. This would provide a valuable extension to the current dualistic critical value coping response calculation. This would provide a matrix of coping responses rather than relying on the dichotomous negative or positive critical value that would map coping responses, still based on perceived threat and perceived efficacy over four areas rather than two. This would extend the conceptual model and enrich coping response classifications. In particular, further research is needed within the non-smoker category to assess how the critical value coping response is influenced by the greater emotional response which describes those in emotion control are expected to have a maladaptive coping response, whereas those in danger control would have a reduction through an adaptive coping response behaviour. By mapping coping response behaviour by emotion of a threat and perceived efficacy misses a lot of other facets that would drive behaviour, intentions and attitudes.

School motivation and sample characteristics

The schools that participated were a mixture of private schools, grammar schools and comprehensive schools. Considering smoking rates were shown to differ between schools classifications, further research would be advised to ensure the samples ratio was equal between school classifications and investigate the role of educational achievement and socio economic influences on smoking attitudes, intentions and behaviours. This current research data collection was unavoidable during the research due to the logistics and the heterogeneity of schools accepting to participate. Also the amount of private schools and grammar is not equally distributed across the schools in the South East of England. Due to smoking rates being unequal, as expected the ratio of amount of smokers to non-smokers was uneven; this meant the sample was

extremely large to ensure an adequate amount of smokers were sampled to ensure statistical significance. Further research would be advised to sample equal amounts of smoker and non-smoking adolescents. The role of school motivation provided insight for further research about how school motivation is an influential factor towards smoking behaviour (Hu *et al.* 1998) and provides evidence for the statements that smoking presents one of the most obvious linear relationship between social class and smoking prevalence (Thirlaway and Upton 2005). Further research is needed on the role of school motivation on smoking behaviours as smokers' had a significantly reduced school motivation compared to non-smokers' which is stated previously that smokers' have lower school engagement than non-smokers (Pyper *et al.* 1987; Abroms *et al.* 2005).

Generalizability issues

This study was confined to 11-13 year old adolescents' in the South East of the UK, thus results may not necessarily be generalizable to all adolescents and communities of the UK or across cultures. There are a number of opportunities for further research. One avenue would be to run a study based on parental socio-economic and employment status which would provide a greater generalizability to the population of the UK. There are various facets that influence adolescents' to smoke, while peers and parental influence are seen to be the most influential, research has uncovered other dimensions that influence the occurrence of smoking. Socio-demographic, family background, school performance as well as many other characteristics are influential factors (Hu, Lin and Keeler 1998). Reports suggest that smoking rates have not changed among the poorest groups for over a decade (Thirlaway and Upton 2009) with a segment of 11 year old adolescents from lower socio economic backgrounds

shown to be heavily influenced by peers and family members smoking prevalence (Heimann-Ratain, Hanson and Peregoy 1985), thus backing claims that smoking among lower socio economic status is ingrained in their social culture (de Vries 1995). Considering the research conclusions were based upon British student views, the implications for threat appeal application to cultures is not generalizable. A wider contribution could be made by conducting a cross cultural study across ethnicity, or even across countries providing evidence regarding developed countries versus developing countries. The findings would provide evidence about how to create global campaigns that can be implemented by charity organisations and provide recommendations for the World Health Organisations marketing campaigns.

Extending research to other media channels

There are opportunities to research responses to threat appeals that are displayed in different media channels. A study using different communications would provide enriched results about how to communicate through different marketing communication methods, particularly the use of word of mouth. There are opportunities to investigate how adolescents' real-time social responses influence their behavioural responses, especially concerning how their social factors influence responses to threat appeals. Developing a study to investigate how word of mouth influences responses to threat appeals would provide innovative findings regarding how threat appeals are disseminated among adolescents' key reference groups at school and provide contrasting results to established programs. A further study using paid advertising would provide findings to contrast print media; especially as there are increasing numbers of paid public health campaigns being commissioned by public health organisations including campaigns like 'Stoptober' to segment the audiences.

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Appendices

Appendix A: Study and Survey Development

Appendix A.1: Propositions and Hypothesis breakdown

Proposition #1; 'There will be significant differences between non-smoking and smoking adolescents' influential factors and responses towards threat appeals'

H(1)	Specific Set of Hypothesis for Proposition #1
H(1.11)	Smokers' will have a more positive smoking attitude than non-smokers
H(1.12)	Smokers' will have a more positive smoking intent than non-smokers
H(1.21)	Smokers' will have a more positive parental view towards smoking than non-smokers
H(1.22)	Smokers' will have a more positive susceptibility to peer pressure than non-smokers
H(1.23)	Smokers' will have a more negative school motivation than non-smokers
H(1.31)	Smokers' perceived efficacy towards smoking will be more positive than non-smokers
H(1.32)	Smokers' perceived threat towards smoking will be more negative than non-smokers
H(1.33)	Smokers' will have a more positive social emotional response than non-smokers
H(1.34)	Non-smokers' will have a more positive physical emotional response than smokers
H(1.35)	Non-smokers' will have a more positive attitude towards the advert than smokers
H(1.36)	Non-smokers' will have a more positive attention towards the advert than smokers
H(1.37)	Smokers' will have a more positive message derogation than non-smokers
H(1.41)	Non-smokers' will have a more positive perceived level of threat towards the advert than smokers
H(1.51)	Non-smokers' will have a more positive critical value than smokers

Proposition #2: 'Post exposure behavioural responses will be significantly different between threats'

H(2)	Specific Set of Hypothesis for Proposition #2
H(2.11)	Physical threats will produce a more negative attitude towards smoking than social threats
H(2.12)	Physical threats will produce a more negative smoking intent than social threats
H(2.13)	Physical threats will produce a more positive smoking intent to quit than social threats
H(2.21)	Physical threats will produce a more positive physical emotional response than social threats
H(2.22)	Social threats will produce a more positive social emotional response than physical threats
H(2.31)	The attitude towards the advert based on physical threats will be more positive than based on social threats
H(2.32)	The attention towards advert for physical threats will be more positive than social threats
H(2.33)	The message derogation towards physical threats will be a more positive than social threats
H(2.41)	The perceived level of threat towards physical threats will be a more positive than social threats

Proposition #3 'The perceived level of threat will significantly influence post exposure responses to each threat condition'

H(3)	Specific Set of Hypothesis for Proposition #3
H(3.11)	The future smoking intent will be more negative for those with a high perceived level of threat towards the threat appeal
H(3.12)	The future smoking attitude will be more negative for those with a high perceived level of threat towards the threat appeal
H(3.13)	The future smoking intent to quit will be more positive for those with a high perceived level of threat towards the threat appeal

Proposition #4: 'The critical value will significantly influence post exposure behavioural responses to each threat condition'

H(4.#)	Specific Set of Hypothesis for Proposition #4
H(4.11)	Danger control will lead to a more negative attitude towards smoking than emotion control
H(4.12)	Danger control will lead to a more negative smoking intent than emotion control
H(4.13)	Danger control will lead to a more positive smoking intent to quit than emotion control
H(4.21)	Danger control will lead to a more negative physical emotional response than emotion control
H(4.22)	Danger control will lead to a more negative social emotional response than emotion control
H(4.31)	Danger control will lead to a more negative attitude towards the advert than emotion control
H(4.32)	Danger control will lead to a more negative attention towards the advert than emotion control
H(4.33)	Danger control will lead to a more negative message derogation than emotion control
H(4.41)	Danger control will lead to a more negative level of threat than emotion control
H(4.51)	The critical value will mediate the future smoking attitude
H(4.52)	The critical value will mediate the future smoking intentions
H(4.53)	The critical value will mediate the future smoking intent to quit

Proposition #5: 'Social factors will significantly influence smoking beliefs and attitudes'

H(5.#)	Specific Set of Hypothesis for Proposition #5
H(5.11)	A positive susceptibility to peer pressure will be associated with a more positive smoking attitude.
H(5.12)	A positive susceptibility to peer pressure will be associated with a more positive smoking intent.
H(5.13)	A positive parental view on smoking will be associated with a more positive smoking attitude.
H(5.14)	A positive parental view on smoking will be associated with a more positive smoking intent.

Proposition #6: 'The type of emotional response will influence post exposure response'

H(6.#)	Specific Set of Hypothesis for Proposition #6
H(6.11)	A positive social emotional response will be associated with a more positive smoking attitude
H(6.12)	A positive social emotional response will be associated with a more positive smoking intent
H(6.13)	A positive physical emotional response will be associated with a more positive smoking attitude
H(6.14)	A positive physical emotional response will be associated with a more positive smoking intent
H(6.15)	A positive social emotional response will be associated with a more positive smoking intent to quit
H(6.16)	A positive physical emotional response will be associated with a more positive smoking intent to quit

Appendix A.2: Consent Form Template

Kent Business School,

University of Kent,
Canterbury,
CT2 7NZ

Date 00/00/00

Re. Anti-smoking questionnaire and workshop with University of Kent

Dear Parent/ Guardian,

The University of Kent are running a piece of research into adolescent's perceptions of anti-smoking marketing and have asked our school to take part. The research aims to provide an insight into the facets that aid the success of anti-smoking advertising targeting adolescents, particularly those under 14 years old. The results will provide information about the type of content that reduces intentions the most as well as the most effective emotion to promote to reduce intentions. The research will provide the NHS with valuable information to help the future creation of preventative behavioural advertising campaigns tackling social issues such as smoking.

The questionnaire will be followed up by an anti-smoking marketing workshop ran by the University of Kent, where your child will be given the opportunity to create an anti-smoking poster advert with the help. The research takes form initially as an online questionnaire that will be administered during PSHE lessons. Pupils will be asked to fill out items relating to their smoking beliefs, intentions and behaviours. They witness a print advert and then complete other questions about their emotional response and future intentions. Pupil's anonymity will remain and the data will be only used in a PhD thesis. The data will not be sold on or used in any other entirety.

I hope this opportunity interests you and your child as it is a great chance to work with the University and show your child about the potential opportunities that stem from postgraduate study.

Kind regards

Riadh Salhi

Please sign if you give consent for your child to participate in the online questionnaire.

Child name

Parents/Guardians name

Signature

Date

Appendix A.3: Questionnaire References

Measure	Item	Reference
Basic	Age, School Gender	De Vries (1995)
School Motivation SM (Scale 1-5)	I pay attention in class, I take school seriously, I want to do well in school,	Pyper *et al.* (1987) Abroms *et al.* (2005)
Smoking Intention SI (Scale 1-5)	In the future, you might smoke one puff or more of a cigarette? You might try out cigarette smoking for a while? If one of your best friends were to offer you a cigarette, would you smoke it? Do you think that you will try smoking a cigarette soon? I often have the urge to smoke	Pierce *et al.* (1996) Pechmann *et al.* (2003) Gilpin *et al.* (2007) Samu and Bhatnagar (2008)
Smoking Attitude SA (Scale 1-5)	Smoking harms your health Smoking looks horrible Smokers are usually more popular than non-smokers In the last few years it has become uncool to smoke Smoking is cool Smokers are tougher than non-smokers. Smoking cigarettes helps you fit in Smoking makes kids look grown up/smoking makes teenagers look older	Norman and Tedeschi (1989) Pechmann and Ratneshwar (1994) Dinh *et al.* (1995) Chassin *et al.* (2003) Carvajal *et al.* (2004) Michaelidou *et al.* (2008)
Susceptibility to peer pressure SPP (Scale 1-5)	Smoking cigarettes is acceptable to my close friends My friends view my smoking positively I look attractive to others as a smoker I look attractive to dates, or potential dates as a smoker I fit well with other people from my age group as a smoker	Conrad *et al.* (1992) Hu *et al.* (1995) Simons-Morton (2004)

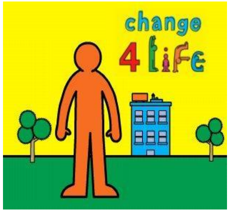
Parental View PV (Scale 1-5)	Think it is harmful, Do not like it, Would be angry. Would be upset Think it will kill you Causes serious illness	Pyper *et al.* (1987) Abroms et al. (2005) Krosnick *et al.* (2006)
Household smokers (Frequency)	Do you live with smoker	Conrad *et al.* (1992) Kremers (2004) Holm *et al.* (2003)
Friend smokers (Frequency)	Number of Friend smokers	Azevedo *et al.* (1999) Chassin *et al.* (2002) Abroms *et al.* (2005)
Smoking experience	Have you ever smoked	Pierce *et al.* (1990) Smith and Stutts (2003) Tangari *et al.* (2007) Dickinson and Holmes (2008)
Smoking length	Smoking frequency	Carvajal *et al.* (2004) Kremers *et al.* (2004)
Witness an advert	Time restraint; 20-30 seconds	Stayman and Aaker (1993) Smith and Stutts (2003)
Type of threat Physical threat/ Social threat (Scale 1-5)	Perception type of threat	Smith and Stutts (2003) Dickinson and Holmes (2008)
Perceived Level of threat PLT (Scale 1-5)	Perceived level of threat	Smith and Stutts (2003) Dickinson and Holmes (2008)

Perceived Efficacy PE (Scale 1-5)	Young people don't get bad skin from smoking It is not dangerous to smoke if you share it with your friends Teenage smokers do not smell as much as adult smokers If you smoke a little it is not dangerous I am confident I will not smoke cigarettes I can resist the urge to smoke cigarettes No-one can pressure me into smoking a cigarettes I find it easy to not smoke cigarettes I believe not smoking prevents most lung cancer. People who do not smoke are less likely to get mouth cancer. Non-smokers have healthier lungs than smokers. People who only smoke a few cigarettes are not under any risk By not smoking I will not be addicted to nicotine. If I smoke cigarettes, I will live a healthy life	Condiotte and Lichtenstein (1981) McCrae (1984) Lawrence (1988) Baer and Lichtenstein (1988) Rippetoe and Rogers (1987) Tanner *et al.* (1991) Chassin (2000) Rimal (2001) Kremers *et al.* (2004) Dickinson and Holmes (2008) Basil *et al.* (2008) Riet *et al.* (2008) Lennon and Rentfro (2010) Perkins *et al.* (2012)
Perceived threat PT (Scale 1-5)	If you smoke you will breathe poisons Smoking kills you early. Smoking causes premature aging Smoking is highly addictive If I smoke cigarettes, I will get heart Disease How harmful do you think it is to use cigarettes frequently/occasionally Smoking will damage your body Smoking is likely to hurt and damage your body Smoking is likely to kill you If you smoke you will probably get some cancer. Smoking increases your chance of having a stroke.	Rippetoe and Rogers (1987) Tanner *et al.* (1991) Chassin *et al.* (2003) Carvajal *et al.* (2004) Pechmann (2004) Tangari *et al.* (2007) Dickinson and Holmes (2008)

	If I smoke, I will be Hooked If you smoke you will probably become addicted to nicotine-	
Emotional response: Physical emotion PEm Social emotion SEm (Scale 1-5)	Emotions felt from watching advert	Holbrook and Batra (1987) King and Reid (1990) Schoenbachler and Whittler (1996) Machleit and Eroglu (2000) Botti, Orfali and Iyenger (2009)
Attitude towards the advert Aad (Scale 1-5)	Bad Good Uninformative informative Ineffective effective Unbelievable believable	Gardner (1985) Mackenzie *et al.* (1986) Homles and Crocker (1987) Donthu (1992)
Message derogation MD (Scale 1-5)	Exaggerated Boring Unrealistic (untrue) Inaccurate (untrue)	Mitchell and Olson (1981) Duncan and Nelson (1985) Gardner (1985) Hill and Mazis (1986) Madden, Allen and Twibble (1988) Shen *et al.* (2011)
Attention towards the advert Atad (Scale 1-5)	How much attention did you pay to the advertisement? The advert caught my attention I paid close attention to the commercial I thought about my own life when I looked at the advert The advert stimulated my imagination I was able to imagine not smoking cigarettes	Bhatnager and Samu 2009 Duncan and Nelson (1985) Block and Keller (1995) Smith *et al.* (2007) Smith, Chen and Yang, (2008)

		Thompson *et al.* (2011)
Advert effect behaviour (Scale 1-5)	How you feel watching the advert will affect your future behaviour? (r)	Smith, Chen and Yang, (2008)
Future smoking intent FSI (Scale 1-5)	How likely do you think you will smoke in the future? Would you like to try out smoking in the next few years? Would you like to see what smoking is like in the future? Would you try one puff of a cigarette Do you think you will be smoking this time next year? At any time during the next year do you think you will smoke a cigarette?	Pierce *et al.* (1996) Pechmann *et al.* (2003) Gilpin *et al.* (2007) White *et al.* (2008)
Future smoking attitude FSA (Scale 1-5)	Smoking helps you make friends Smoking helps you relax Smoking is not very dangerous. Smokers are cooler than non-smokers. Smoking makes you look more mature	Chassin *et al.* (2003) Carvajal *et al.* (2004) Samu and Bhatnagar (2008) Michealidou *et al.* (2008)
Future smoking intent to quit FSIQ (Scale 1-5)	I intend to quit smoking I expect to quit smoking I will try to quit smoking How long will you smoke? Are you considering stopping smoking within the next 6 months?	Emery *et al.* (2000) Tangari *et al.* (2007)

Appendix A.4: Adverts Iterations

Study 1	Study 2	Study 3	Study 4	Study 5
				
				
				
				
				
				
				
				

Appendix A.5: Final Questionnaire including all final adverts

(This is the paper copy, the questionnaire was also administered via email through the Qualtrics link: http://kbs.az1.qualtrics.com/SE/?SID=SV_0O0W60SKJC2HVwp)

Anti-Smoking Advertisement Questionnaire

You are about to fill out a questionnaire that is going to help make a new national advertisement that will be aimed at people your age. What we need is an insight into how people your age respond to certain types of print adverts.

Please help by truthfully filling out the questionnaire, it is mainly scales and should be quick and easy to complete.

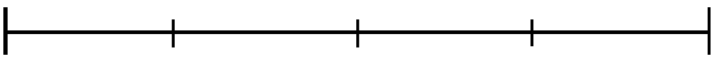
We will not ask for your name so no-one will know how YOU answered the questionnaire.

The information will be used by the University of Kent.

Example Question

a) On the line below mark a cross that shows how likely each statement is…
1 meaning **definitely no** and 5 meaning **definitely yes**

(i) In the future, you **might** run a marathon?



1 (Definitely No) 5 (Definitely Yes)

Q1 Gender

- ❍ Male
- ❍ Female

Q2 Age

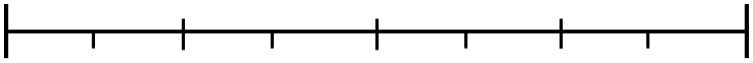
- ❍ 11
- ❍ 12
- ❍ 13

Q3 What school do you go to?

_____

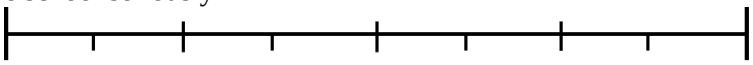
Q4 On the line below **mark a cross at** the **point** that shows;
'How much you **AGREE** with the following statements'
1 meaning '**strongly disagree**' and 5 meaning '**strongly agree**'

(i) I pay attention in class



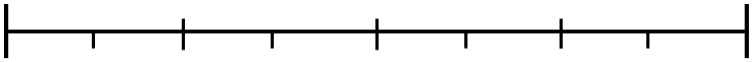
1 (strongly disagree) 5 (strongly agree)

(ii) I take school seriously



1 5

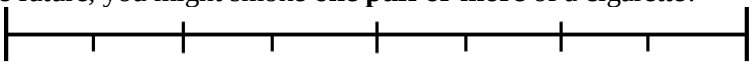
(iii) I want to do well in school



1 5

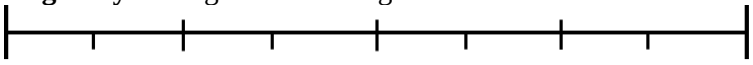
Q5 On the line below **mark a cross at** the **point** that shows;
How **LIKELY** you think each statement is;
1 meaning '**definitely no**' and 5 meaning '**definitely yes**'

(i) In the future, you might smoke **one puff or more** of a cigarette?



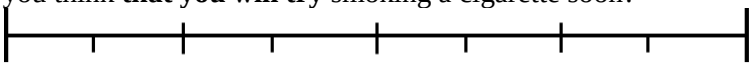
1 (Definitely No) 5 (Definitely Yes)

(ii) You **might try out** cigarette smoking for a while?



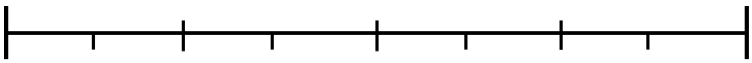
1 5

(iii) Do you think **that you will try** smoking a cigarette soon?



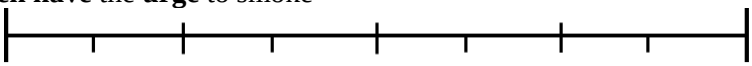
1 5

(iv) If one of your **best friends** were to offer you a cigarette, **would you smoke it?**



1 5

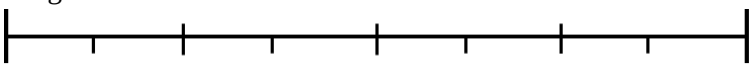
(v) **I often have** the **urge** to smoke



1 5

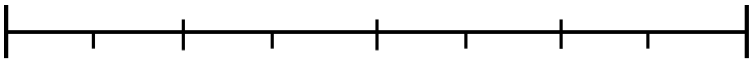
Q6 On the line below **mark a cross at** the **point** that shows;
How you **FEEL** about each statement;
1 meaning '**strongly disagree**' and 5 meaning '**strongly agree**'

i) Smoking looks cool.



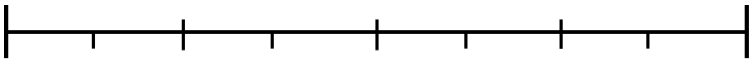
1(Strongly disagree) 5 (Strongly agree)

ii) Smoking does not really harm your health



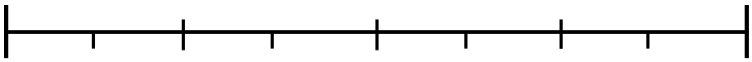
1(Strongly disagree) 5 (Strongly agree)

iii) Smoking looks horrible.



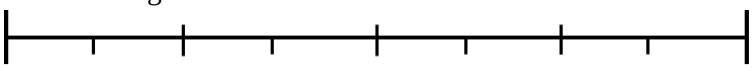
1(Strongly disagree) 5 (Strongly agree)

iv) Smokers are more popular than non-smokers.



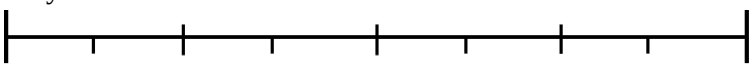
1(Strongly disagree) 5 (Strongly agree)

v) Smokers are tougher than non-smokers.



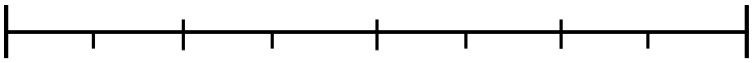
1(Strongly disagree) 5 (Strongly agree)

vi) Recently it has become un-cool to smoke.



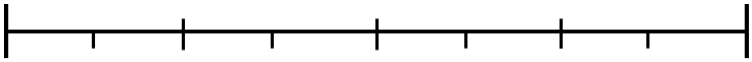
1(Strongly disagree) 5 (Strongly agree)

vii) Smoking helps you fit in.



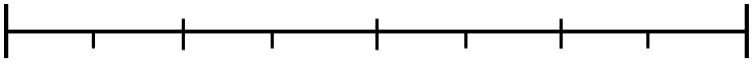
1(Strongly disagree) 5 (Strongly agree)

viii) Smoking makes teenagers look older.



1(Strongly disagree) 5 (Strongly agree)

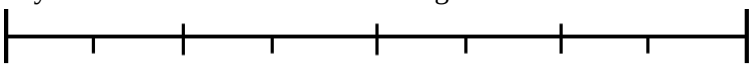
ix) Smoking helps you make friends.



1(Strongly disagree) 5 (Strongly agree)

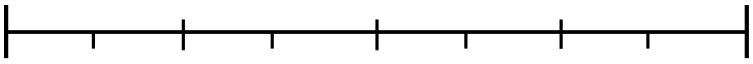
Q7 On the line below **mark a cross at** the **point** that shows;
What you **THINK** about each statement;
1 meaning '**strongly disagree**' and 5 meaning '**strongly agree**'

i) My friends think it is ok to smoke cigarettes.



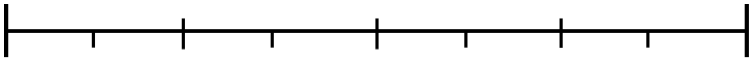
1(strongly disagree) 5 (strongly agree)

ii) My friends think that smoking is cool.



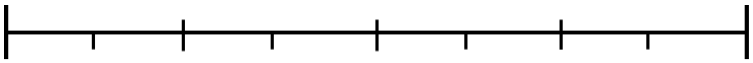
1 5

iii) Smoking makes you look attractive.



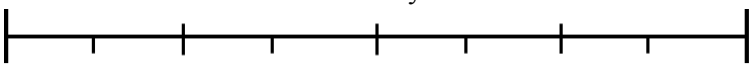
1 5

iv) Smoker's look cool to others.



1 5

v) Smoker's would fit in well with my friends.



1 5

Q8 How many of your friends SMOKE cigarettes? _____

Q9 How many people in your house smoke cigarettes? _____

Q10 If you live with smokers, how are you related? If you do not leave blank
_____

Q11 Have you ever tried smoking?

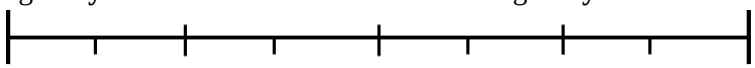
- ❍ Never Tried
- ❍ Tried at least one puff
- ❍ Smoked a whole cigarette
- ❍ Shared a cigarette
- ❍ Smoke once a week
- ❍ Smoke once a month
- ❍ Smoke more regularly

If you smoke, how long have you smoked for?

- ❍ Only tried once
- ❍ Less than 4 weeks
- ❍ Less than 2 months
- ❍ Less than 6 months
- ❍ Less than 1 year
- ❍ More than 1 year

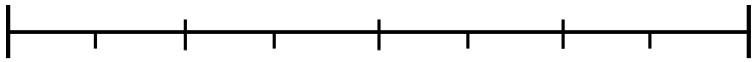
How many cigarettes do you smoke in a week? _____

Q12 On the line below **mark a cross at** the **point** that shows;
Your parent's or guardian's **views** about smoking;
1 meaning '**they think it is harmful**' and 5 meaning '**they think it is harmless**'



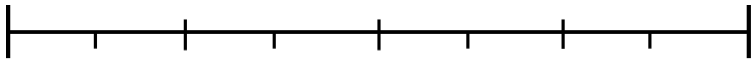
1 (Think it is harmful) 5 (Think it is harmless)

Q13 On the line below **mark a cross at** the **point** that shows;
Your parent's or guardian's **views** about smoking;
1 meaning '**they do not like it**' and 5 meaning '**they like it**'



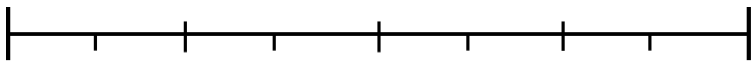
1 (they do not like it) 5 (they like it)

Q14 On the line below **mark a cross at** the **point** that shows;
Your parent's or guardian's **views** about smoking;
1 meaning '**they would be angry**' and 5 meaning '**they would not be angry**'



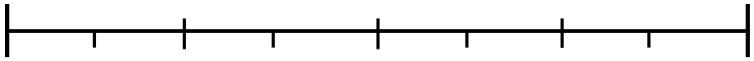
1 (they would be angry) 5 (they would not be angry)

Q15 On the line below **mark a cross at** the **point** that shows;
How **upset** your parent's or guardian's would be if they found out you smoked cigarettes
1 meaning **'they would be extremely upset'** and 5 meaning '**they would be extremely upset**'



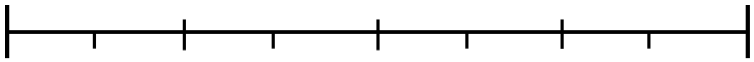
1 (Be extremely upset) 5 (Not at all upset)

Q16 On the line below **mark a cross at** the **point** that shows;
Your parent's or guardian's **views** about smoking;
1 meaning **'they think it will kill you'** and 5 meaning **'they do not think it will kill you'**



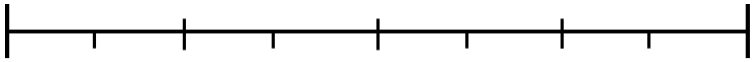
1 (It will kill you) 5 (It will not kill you)

Q17 On the line below **mark a cross at** the **point** that shows;
Your parent's or guardian's **views** about smoking;
1 meaning **'they think it causes serious illness and diseases'** and 5 meaning **'they do not think it cause serious illness and diseases'**



1 (Causes serious disease & illness) 5(Doesn't cause serious disease & illness)

Q18 On the line below **mark a cross at** the **point** that shows;
How many times your parent's or guardians **have spoken to you** about smoking:
1 meaning **'not at all'** and 5 meaning **'a lot'**



1 (not at all) 5 (a lot)

Q19 Has anyone in your family **DIED** from smoking?

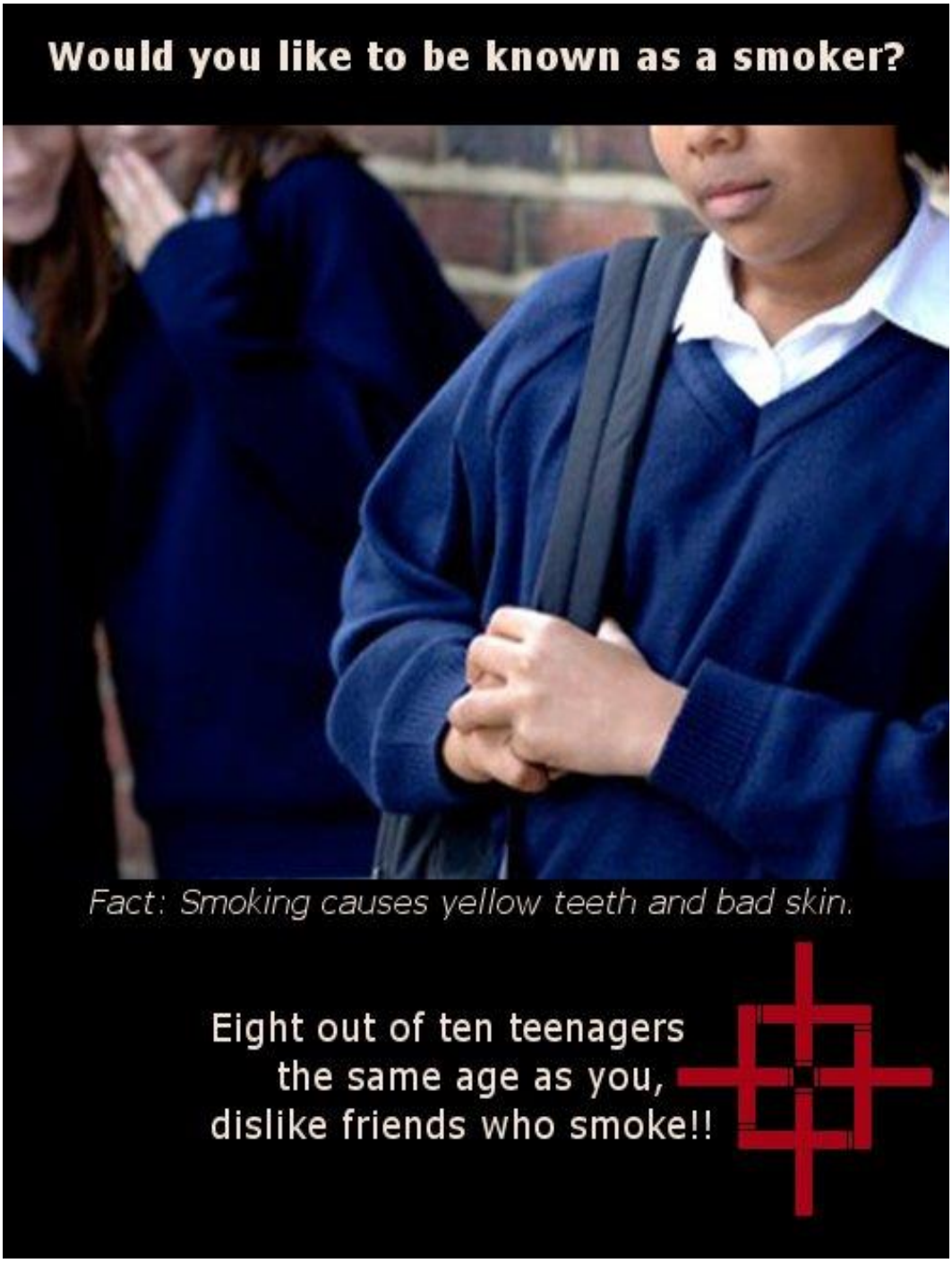
- ❍ Yes
- ❍ No

Q20 Has anyone in your family **SUFFERED** from cancer or other health problems from smoking?

- ❍ Yes
- ❍ No

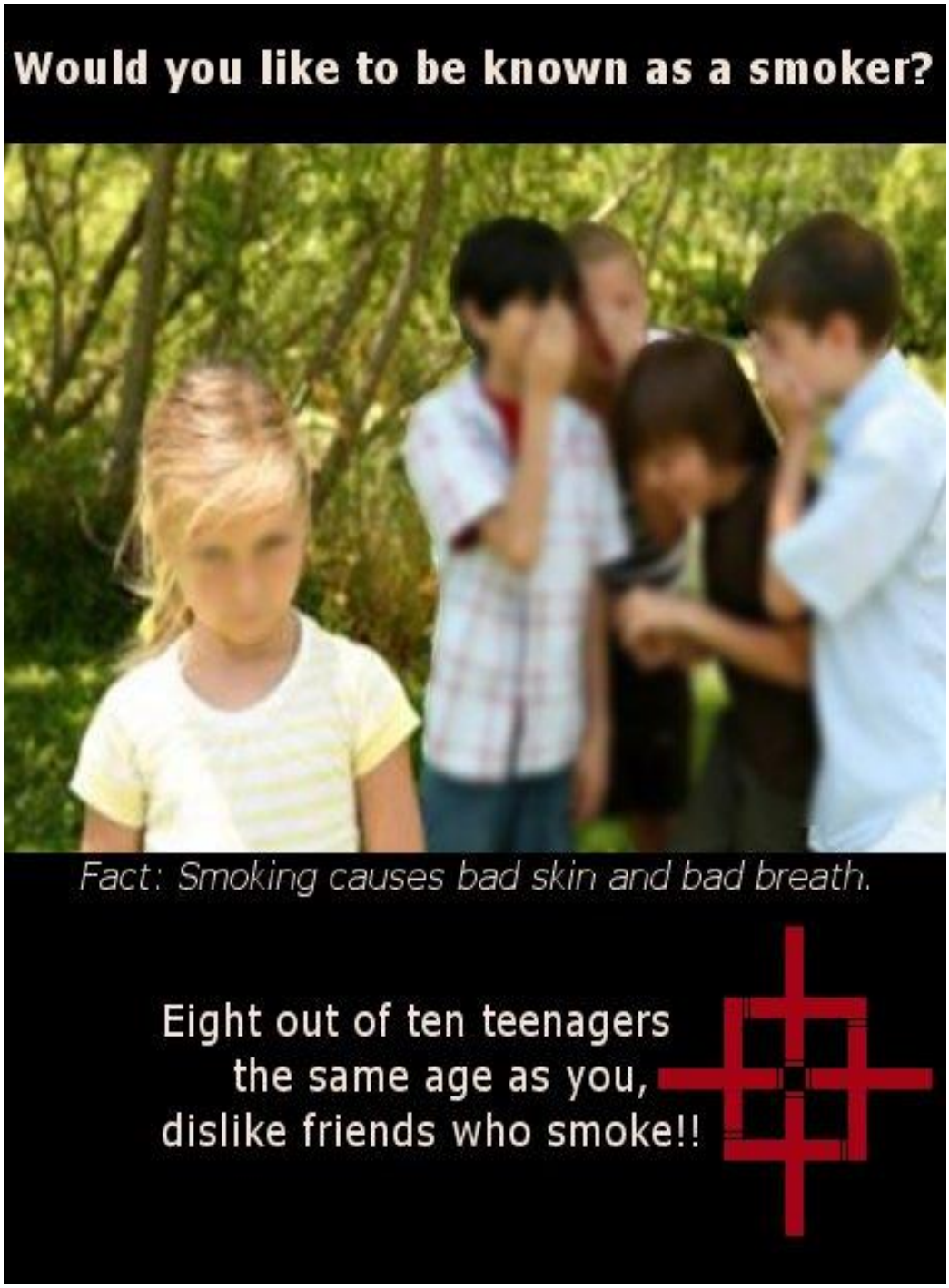
Q21 You will now see an anti-smoking advertisement for 30 seconds.
Please look at it carefully and think how you would feel being a smoker?
Remember the Advert Letter.

Q21A **Remember this is Advert A**



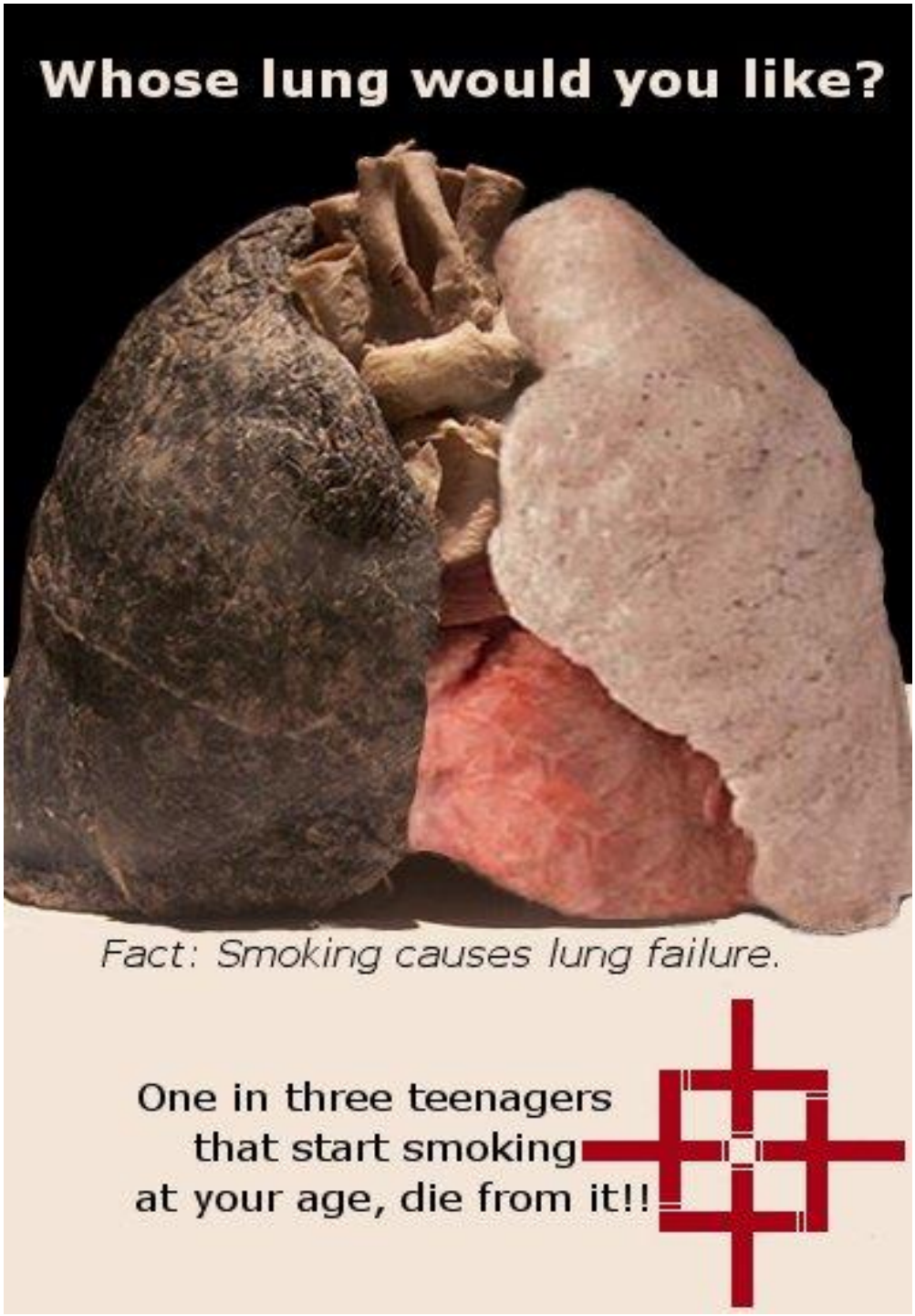
Q21 You will now see an anti-smoking advertisement for 30 seconds.
Please look at it carefully and think how you would feel being a smoker?
Remember the Advert Letter.

Q21B **Remember this is Advert B**



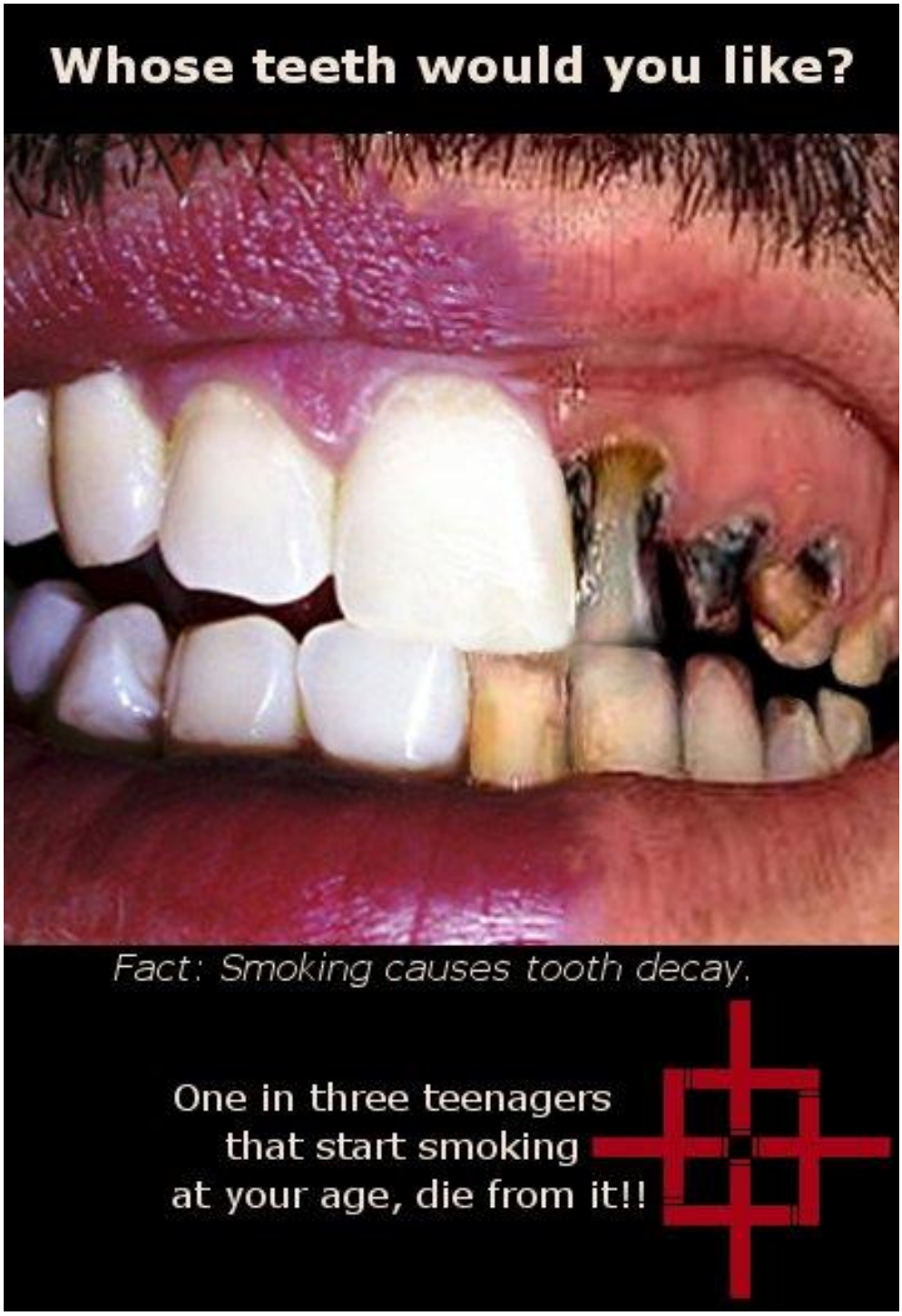
Q21 You will now see an anti-smoking advertisement for 30 seconds.
Please look at it carefully and think how you would feel being a smoker?
Remember the Advert Letter.

Q21C **Remember this is Advert C**



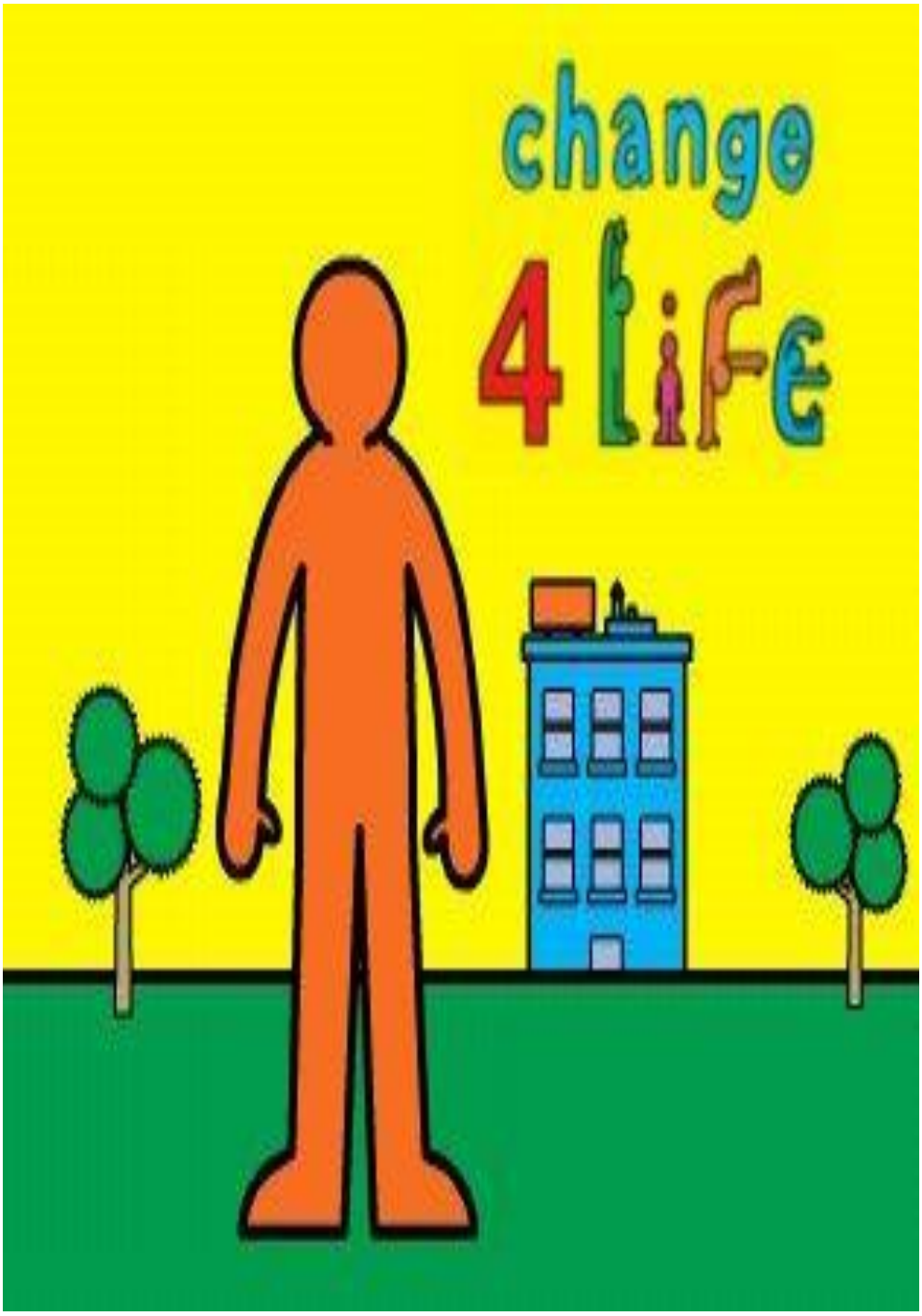
Q21 You will now see an anti-smoking advertisement for 30 seconds.
Please look at it carefully and think how you would feel being a smoker?
Remember the Advert Letter.

Q21D **Remember this is Advert D**



Q21 You will now see an anti-smoking advertisement for 30 seconds.
Please look at it carefully and think how you would feel being a smoker?
Remember the Advert Letter.

Q21E **Remember this is Advert E**

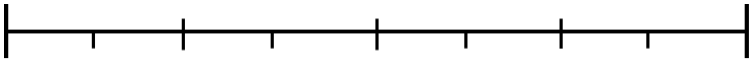


Q22 Which advert did you see?

- A (girl in blue school uniform)
- B (young girl)
- C (lungs)
- D (teeth)
- E (change for life)

Q23 On the line below **mark a cross at** the **point** that shows;
'How threatening you personally FELT the advert was'
1 meaning **'not at all'** and 5 meaning **'a lot'**

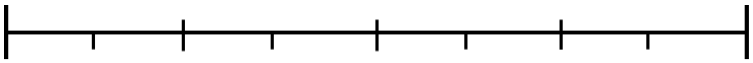
Level of threat



1(not at all) 5 (A lot)

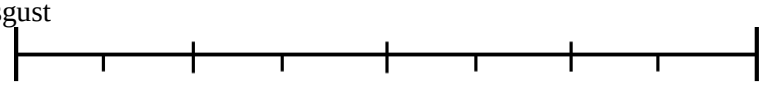
Q24 On the line below **mark a cross at** the **point** that shows;
'How much you **FELT** each **emotion** from **watching the advert?'**
1 meaning **'not very much'** and 5 meaning **'a lot'**

(i) Shame



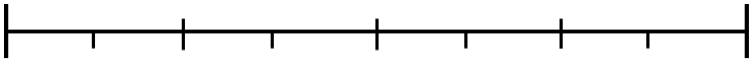
1(Not very much) 5 (A lot)

(ii) Disgust



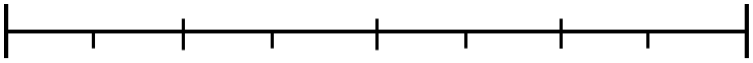
1 5

(iii) Embarrassment



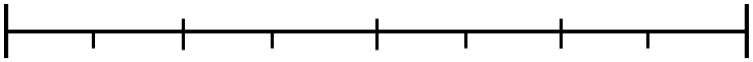
1 5

(iv) Guilt



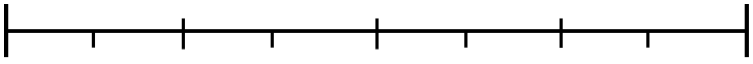
1 5

(v) Fear



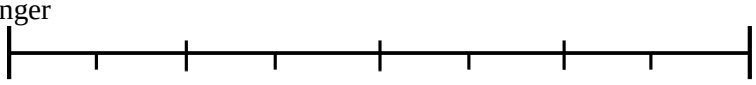
1 5

(vi) Sadness



1 5

(viI) Anger



1 5

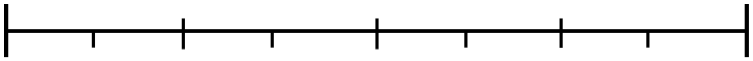
Q25 Rank the emotions you **FELT** most from watching the advert;
Rank each emotion from **7 being the emotion felt most to 1 being the emotion felt least**

_____ Shame
_____ Disgust
_____ Embarrassment
_____ Guilt
_____ Fear
_____Sadness
_____ Anger

For the next question only, try to **imagine that you HAVE smoked cigarettes for a LONG TIME**.
Think of how **YOU** would respond to the advertisement **being a smoker**.

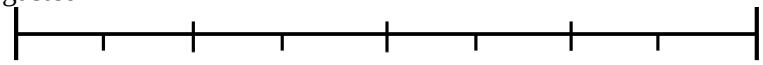
Q26 Please answer this question as if you **WERE** a long term **SMOKER**-
On the line below **mark a cross at** the **point** that shows;
'How much would the **advert** make you **FEEL each emotion?'**
1 meaning '**not very much**' and 5 meaning '**a lot**'

(i) Shameful



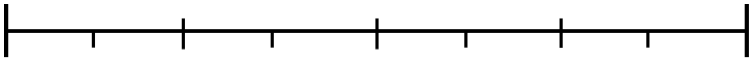
1(Not very much) 5 (A lot)

(ii) Disgusted



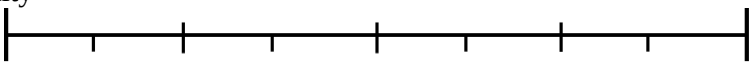
1 5

(iii) Embarrassed



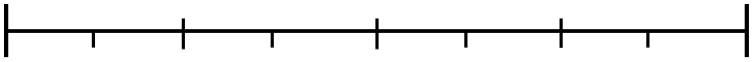
1 5

(iv) Guilty



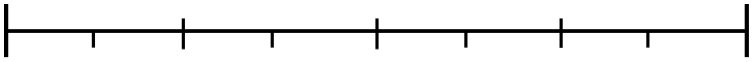
1 5

(v) Fear



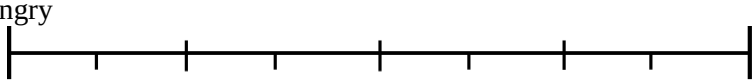
1 5

(vi) Sad



1 5

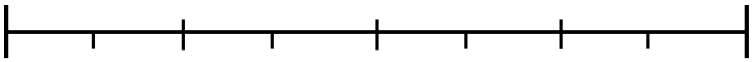
(viI) Angry



1 5

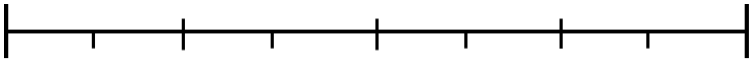
Q27 On the line below **mark a cross at** the **point** that shows
'How you **FEEL** about each statement'
1 meaning **'strongly disagree'** and 5 meaning **'strongly agree'**

i) I am confident I will not smoke cigarettes



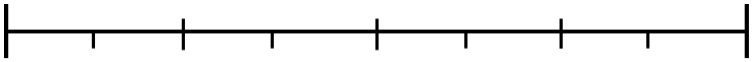
1(strongly disagree) 5 (strongly agree)

ii) I can resist the urge to smoke cigarettes



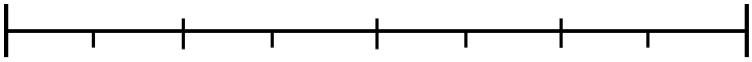
1(strongly disagree) 5 (strongly agree)

iii) No-one can pressure me into smoking cigarettes



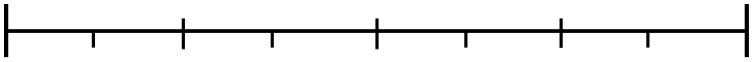
1(strongly disagree) 5 (strongly agree)

iv) I find it easy to not smoke cigarettes



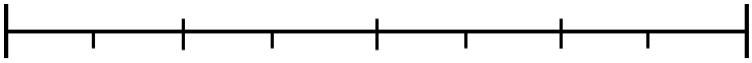
1(strongly disagree) 5 (strongly agree)

v) I believe not smoking prevents most lung cancer.



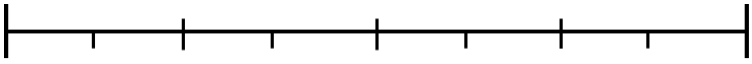
1(strongly disagree) 5 (strongly agree)

vi) People who do not smoke are less likely to get mouth cancer.



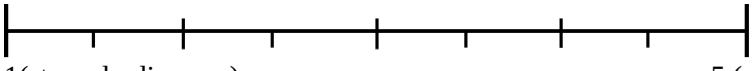
1(strongly disagree) 5 (strongly agree)

vii) Non-smokers have healthier lungs than smokers.



1(strongly disagree) 5 (strongly agree)

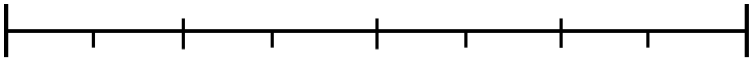
viii) By not smoking I will not get addicted to nicotine.



1(strongly disagree) 5 (strongly agree)

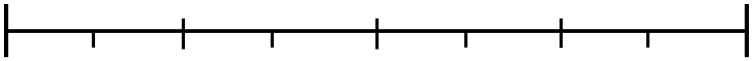
Q28 On the line below **mark a cross at** the **point** that shows
'How you **FEEL** about each statement'
1 meaning '**strongly disagree**' and 5 meaning '**strongly agree**'

i) If you smoke you will probably become addicted to nicotine



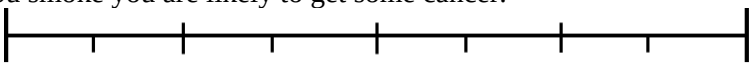
1(strongly disagree) 5 (strongly agree)

ii) Smoking could eventually kill you.



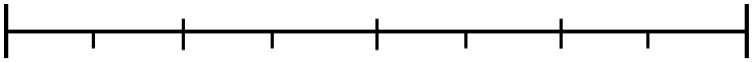
1(strongly disagree) 5 (strongly agree)

iii) If you smoke you are likely to get some cancer.



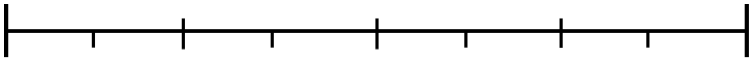
1(strongly disagree) 5 (strongly agree)

iv) Smoking increases your chance of having health problems.



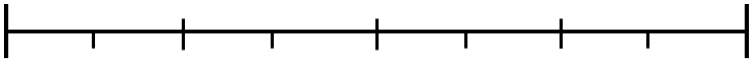
1(strongly disagree) 5 (strongly agree)

v) If you smoke you will breathe in poisonous gas.



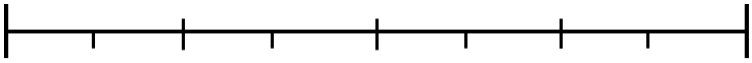
1(strongly disagree) 5 (strongly agree)

vi) Smoking shortens your life.



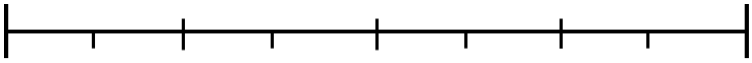
1(strongly disagree) 5 (strongly agree)

vii) Smoking will damage your body



1(strongly disagree) 5 (strongly agree)

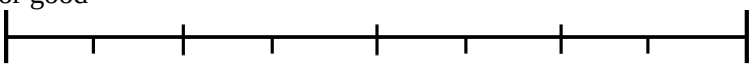
viii) Smoking is highly addictive.



1(strongly disagree) 5 (strongly agree)

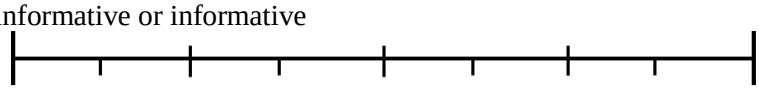
Q29 On the line below **mark a cross at** the **point** that shows;
'Your response to the advert on a scale of 1 to 5'
Do **YOU** think the advert is?

(i) Bad or good



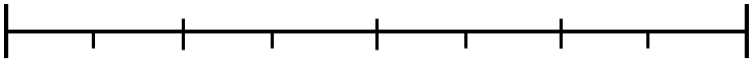
1 Bad 5 Good

(ii) Uninformative or informative



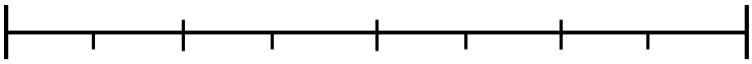
1Uninformative 5 Informative

(iii) Ineffective or effective



1 Ineffective 5 Effective

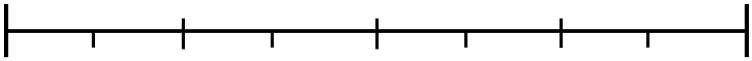
(iv) Unbelievable or believable



1 Unbelievable 5 Believable

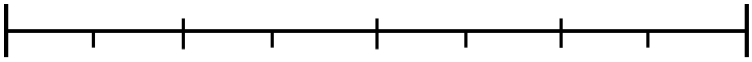
Q 30 On the line below **mark a cross at** the **point** that shows
'In **YOUR** opinion, to what **EXTENT** was the advert you have just seen'
1 meaning **'To a small extent'** and 5 meaning **'To a great extent'**

(i) The advert was **EXAGGERATED**



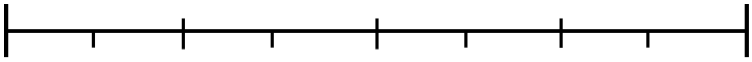
1 To a small extent 5 To a great extent

(ii) The advert was **BORING**



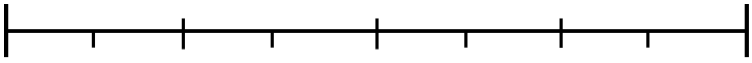
1 To a small extent 5 To a great extent

(iii) The advert was **UNREALISTIC**



1 To a small extent 5 To a great extent

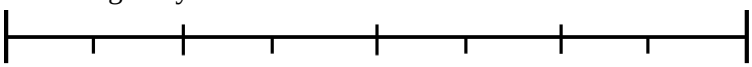
(iv) The advert was **INACCURATE**



1 To a small extent 5 To a great extent

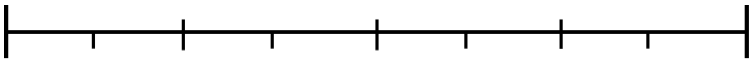
Q31 On the line below **mark a cross at** the **point** that shows
'How much **YOU AGREE** with the following statements'
1 means **'not at all'** and 5 means **'a lot'**

i) The advert caught my interest.



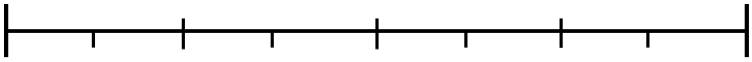
1 (not at all) 5 (a lot)

ii) I paid close attention to the advert.



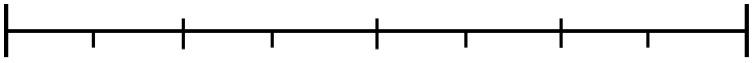
1 (not at all) 5 (a lot)

iii) I thought about my life when watching the advert.



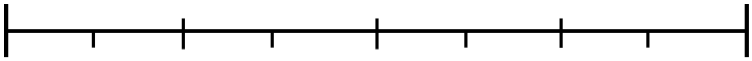
1 (not at all) 5 (a lot)

iv) The advert stimulated my imagination.



1 (not at all) 5 (a lot)

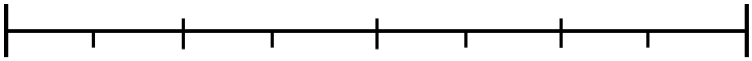
v) I was able to imagine not smoking cigarettes.



1 (not at all) 5 (a lot)

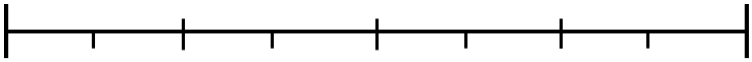
Q33 On the line below **mark a cross at** the **point** that shows
'How **YOU FEEL** about smoking'
1 means **'Strongly disagree'** and 5 means **'Strongly agree'**

i) Smoking helps you make friends.



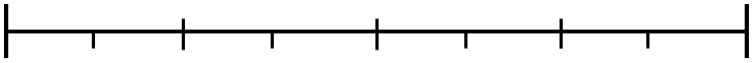
1 (strongly disagree) 5 (strongly agree)

ii) Smoking helps you relax.



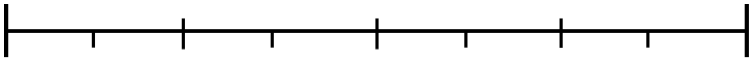
1 (strongly disagree) 5 (strongly agree)

iii) Smoking is not very dangerous.



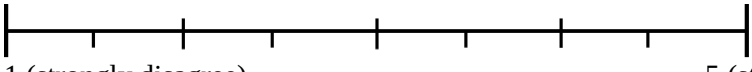
1 (strongly disagree) 5 (strongly agree)

iv) Smokers are cooler than non-smokers.



1 (strongly disagree) 5 (strongly agree)

v) Smoking makes you look more mature.

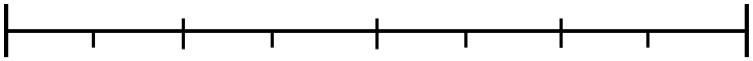


1 (strongly disagree) 5 (strongly agree)

If you have **NEVER** smoked or tried a cigarette answer this question **Q32**, If you **HAVE** smoked go to **Q33…**

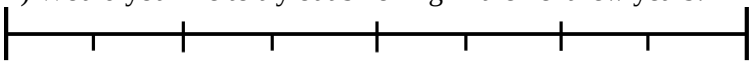
Q32) On the line below **mark a cross at** the **point** that shows
'YOUR response to the questions':
1 means '**Not very likely**' and 5 means '**Very likely**'

i) How likely do you think you will smoke in the future?



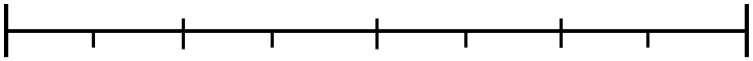
1 (not very likely) 5 (very likely)

ii) Would you like to try out smoking in the next few years?



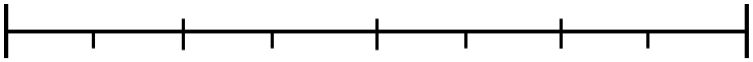
1 (not very likely) 5 (very likely)

iii) Would you like to see what smoking is like in the future?



1 (not very likely) 5 (very likely)

iv) Would you try one puff of a cigarette?

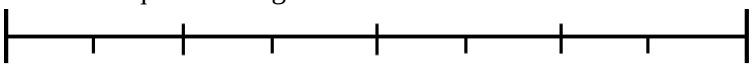


1 (not very likely) 5 (very likely)

If you **HAVE** smoked or tried a cigarette answer this question **Q33,**
If you have **NEVER** smoked go to question **Q34…**

Q33a (i) On the line below **mark a cross at** the **point** that shows;
‘You **INTEND** to **QUIT** smoking’
1 means '**Very Unlikely**' and 5 means '**Very Likely**'

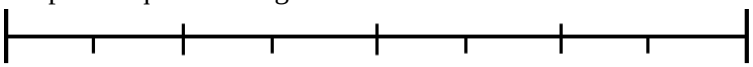
I intend to quit smoking



1 (Very unlikely) 5 (very likely)

Q33b (ii) On the line below **mark a cross at** the **point** that shows;
‘You **EXPECT** to **QUIT** smoking’
1 means '**Very Unlikely**' and 5 means '**Very Likely**'

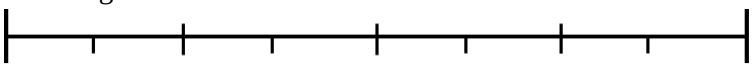
I expect to quit smoking



1 (very unlikely) 5 (very likely)

Q33c (iii) On the line below **mark a cross at** the **point** that shows;
‘You **WILL TRY** to **QUIT** smoking’
1 means '**Very Unlikely**' and 5 means '**Very Likely**'

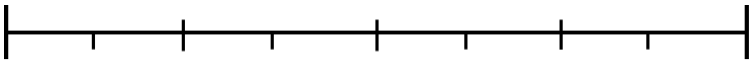
I will try to quit smoking



1 (very unlikely) 5 (very likely)

Q33d (iv) On the line below **mark a cross at** the **point** that shows;
‘How **LONG** do you think you **WILL** smoke **FOR**?’
1 means '**Only a short time**' and 5 means '**Most of my life**'

How long do you THINK you will you smoke?



1 (Only a short time) 5 (Most of my life)

Q34 END Thank-you for taking part,
We hope to use your answers to make an advert to stop young people from starting to smoke.

Q35 Optional Question How would you improve the questionnaire?

_____
_____
_____
_____

Appendix B: Final study

Appendix B.1: Full sample analysis

Appendix B.1.1: Full Sample participating schools

Table: Full Sample School distribution

School	Frequency	Percent
Fort Pitt Girls Grammar	213	11.6
Herne Bay High School	165	9.0
Simon Langton Girls Grammar School	299	16.3
Spires Technology College	13	.7
Saint Lawrence College	34	1.9
Walderslade Girls	206	11.2
Abbey School Faversham	10	.5
Robert Napier	219	11.9
Saint Georges Church of England	95	5.2
Thames View	156	8.5
Hundrend of Hoo	93	5.1
Astor College Dover	121	6.6
Charles Dickens School	105	5.7
Chatham Grammar School Boys	41	2.2
Hartsdown Academy	67	3.6
Total	1837	100

Appendix B.1.2: Full study pattern matrix

Table: Full Data Set Pattern Matrix

Factor	PT	SI	PE	ATAD	PV	AAD	SM	SA	MD	FSA	SPP
Factor	**PT7**	**SI3**	**PE4**	**ATAD4**	**PV5**	**AAD2**	**SM2**	**SA9**	**MD4**	**FSA1**	**SPP2**
Item	.880	.958	.811	.796	.818	.827	.931	.789	.782	.871	.893
	PT6	**SI2**	**PE2**	**ATAD2**	**PV6**	**AAD3**	**SM1**	**SA7**	**MD3**	**FSA4**	**SPP1**
	.856	.921	.801	.785	.814	.739	.752	.728	.715	.757	.817
	PT3	**SI5**	**PE3**	**ATAD3**	**PV1**	**AAD4**	**SM3**	**SPP3**	**MD1**	**FSA2**	**SPP5**
	.855	.839	.791	.782	.705	.690	.611	.539	.669	.477	.382
	PT2	**SI4**	**PE1**	**ATAD1**	**PV2**	**AAD1**		SA1			
	.846	.822	.770	.762	.669	.663		.522			
	PT4	**SI1**	**PE8**								
	.771	.727	.480								
	PT5		**PE7**								
	.765		.432								
	PT8										
	.692										
	PT1										
	.659										

Appendix B.1.3: Factor Correlation Matrix and squared correlation tests

Table: Factor Correlation Matrix (total data set)

Factor	PT	SI	PE	ATAD	PV	AAD	SM	SA	MD	FSA	SPP
PT	-										
SI	-.241	-									
PE	.555	-.455	-								
ATAD	.293	-.116	.205	-							
PV	-.300	.425	-.240	-.130	-						
AAD	.382	-.129	.323	.635	-.116	-					
SM	.250	-.411	.339	.150	-.263	.182	-				
SA	-.293	.623	-.406	-.126	.416	-.136	-.358	-			
MD	-.056	.208	-.114	-.074	.172	-.227	-.214	.216	-		
FSA	-.327	.473	-.405	-.142	.383	-.178	-.317	.593	.301	-	
SPP	-.213	.589	-.342	-.080	.328	-.155	-.361	.641	.252	.440	-

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization

Table: Squared correlation test SA

Item	Correlated	Item	Correlation	C^2	AVE
SA	<-->	PT	-0.293	0.085849	0.429
SA	<-->	SI	0.623	0.388129	0.429
SA	<-->	PE	-0.406	0.164836	0.429
SA	<-->	ATAD	-0.126	0.015876	0.429
SA	<-->	PV	0.416	0.173056	0.429
SA	<-->	AAD	-0.136	0.018496	0.429
SA	<-->	SM	-.358	0.128164	0.429
SA	<-->	MD	0.216	0.046656	0.429
SA	<-->	FSA	0.593	0.351649	0.429
SA	<-->	SPP	0.641	0.410881	0.429

Table: Squared correlation test PE

Item	Correlated	Item	Correlation	C^2	AVE
PE	<-->	PT	0.555	0.308025	.489
PE	<-->	SI	-0.455	0.207025	.489
PE	<-->	ATAD	0.205	0.042025	.489
PE	<-->	PV	-0.24	0.0576	.489
PE	<-->	AAD	0.323	0.104329	.489
PE	<-->	SA	0.339	0.114921	.489
PE	<-->	SM	-0.406	0.164836	.489
PE	<-->	MD	-0.114	0.012996	.489
PE	<-->	FSA	-0.405	0.164025	.489
PE	<-->	SPP	-0.342	0.116964	.489

Appendix B.1.4: Factor Correlation table

Factor	PT	SI	PE	ATAD	PV	AAD	SM	MD	FSA	SPP	SA
PT	1.000										
SI	-.232	1.000									
PE	.524	-.402	1.000								
ATAD	.269	-.100	.182	1.000							
PV	-.277	.365	-.204	-.097	1.000						
AAD	.343	-.115	.296	.552	-.098	1.000					
SM	.226	-.365	.294	.121	-.222	.165	1.000				
MD	-.051	.173	-.095	-.056	.142	-.185	-.171	1.000			
FSA	-.287	.427	-.350	-.115	.316	-.156	-.272	.253	1.000		
SPP	-.202	.537	-.308	-.066	.282	-.153	-.326	.208	.408	1.000	
SA	-.258	.504	-.320	-.098	.323	-.099	-.288	.157	.479	.495	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Appendix B.1.5: C²tests

Table: Chi-square test

Factor	PT	SI	PE	ATAD	PV	AAD	SM	SA	MD	FSA	SPP
PT	*2558.8*										
	*965****										
SI	3829.7	*2558.8*									
	966***	*965****									
PE	2936	4326.8	*2558.8*								
	966***	966***	*965****								
ATAD	2876.6	3242.2	2972.3	*2558.8*							
	966***	966***	966***	*965****							
PV	3828.3	2871.7	3826.8	3225.5	*2558.8*						
	966***	966***	966***	966***	*965****						
AAD	2873.7	3402.8	2949.7	2569.9	3346.4	*2558.8*					
	966***	966***	966***	966***	966***	*965****					
SM	3657.6	5470.2	3581.6	3392	4332.3	3466.7	*2558.8*				
	966***	966***	966***	966***	966***	966***	*965****				
SA	4493.7	3075	4777.7	3716.2	3318.5	3899.4	4051.3	*2558.8*			
	966***	966***	966***	966***	966***	966***	966***	*965****			
MD	3483.7	3070	3561.5	3219.6	3101.9	3473	4153	3503.6	*2558.8*		
	966***	966***	966***	966***	966***	966***	966***	966***	*965****		
FSA	4054.8	2861.1	4221.1	3330.1	2977.6	3507.8	4462.9	3205.2	3034.9	*2558.8*	
	966***	966***	966***	966***	966***	966***	966***	966***	966***	*965****	
SPP	4101.9	2844.7	4373.9	3447.7	3120.7	3634.9	5946.4	3292.8	3232	3024.1	*2558.8*
	966***	966***	966***	966***	966***	966***	966***	966***	966***	966***	*965****

Appendix B.1.6: Emotion EFA

a) Phase 1 (All emotions)

Table: Emotion EFA Pattern Matrix

	Component	
	1	2
Felt Guilt	.925	
Felt Embarrassment	.904	
Felt Shame	.772	
Felt Disgust		.973
Felt Fear		.828
Felt Sadness		.642
Felt Anger	.337	.527

b) Phase 2 (remove Anger)

Table: Emotion EFA Pattern Matrix

	Component	
	1	2
Felt Guilt	.919	
Felt Embarrassment	.899	
Felt Shame	.774	
Felt Disgust		.960
Felt Fear		.826
Felt Sadness		.621

Appendix B.1.7: Smoking attitude to future smoking intent relationship between threats

Table: SA→FSA (PT V. ST) Group Differences and Regression Weights

			Physical threat		**Social threat**		
	Relationship		Estimate	P	Estimate	P	z-score
SA	→	FSA	0.918	0.000	0.862	0.000	-0.538

Table: SA→FSA (PT V. ST) Squared multiple correlations

	Physical threat	**Social threat**
SA	.000	.000
FSA	.444	.422

Appendix B.1.8: Mediation Analysis

a) SA→CV→FSA (Physical Threat)

The CV mediates the relationship between SI and FSIQ (n=758)	
SI→CV (a)	-.2257, p=.0002
CV→ FSA (b)	-.0948, p=.0022
SA→FSA (direct)	.5394, p<.0001
SA →FSA (total)	.5608, p<.0001
Indirect	.0214, llci .0069 / ulci .0452

b) SA→CV→FSA (Social Threat)

The CV mediates the relationship between SI and FSIQ (n=731)	
SI→CV (a)	-.2258, p=.0008
CV→ FSA (b)	-.0134, p=.6793
SA→FSA (direct)	.4478, p<.0001
SA →FSA (total)	.4508, p<.0001
Indirect	.0030, llci -.0145 / ulci .0252

Appendix B.1.9: Full model structural equations model

Table: Full model structural equations model (SEM) regression weights

Relationship			Estimate	S.E.	C.R.	P
PV	→	SI	.301	.028	10.882	***
PV	→	SA	.222	.021	10.601	***
SPP	→	SI	.739	.038	19.272	***
SPP	→	SA	.513	.029	17.443	***
SA	→	PE	-.380	.040	-9.488	***
SA	→	PT	-.548	.053	-10.251	***
SI	→	PE	-.184	.021	-8.719	***
SI	→	PT	-.038	.028	-1.361	.174
PE	→	FSA	-.409	.038	-10.793	***
PT	→	FSA	-.144	.021	-6.805	***

Table: Full model SEM squared multiple correlations

Factor	SMC
SPP	.000
PV	.000
SA	.520
SI	.410
PE	.271
PT	.139
FSA	.188

Appendix B.1.10: Full model differences between samples

Table: Full model (NS V S) Group Differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
PV	→	SI	0.192	0.000	0.350	0.000	1.896*
PV	→	SA	0.162	0.000	0.336	0.000	2.4**
SPP	→	SI	0.618	0.000	0.684	0.000	0.677
SPP	→	SA	0.603	0.000	0.616	0.000	0.137
SA	→	PE	-0.544	0.000	-0.196	0.000	3.847***
SA	→	PT	-0.614	0.000	-0.484	0.000	0.980
SI	→	PE	-0.199	0.000	-0.147	0.000	0.984
SI	→	PT	-0.116	0.007	0.011	0.868	1.629
PE	→	FSA	-0.238	0.000	-0.423	0.000	-1.68*
PT	→	FSA	-0.128	0.000	-0.158	0.000	-0.619

Table: Full model (NS V. S) Squared Multiple correlations

	Non-smokers	Smokers
SPP	.000	.000
PV	.000	.000
SA	.322	.649
SI	.177	.408
PE	.151	.284
PT	.101	.139
FSA	.102	.197

Appendix B.1.11: Full Model differences between samples for physical threats

Table: Full Model (PT; NS V. S) Group differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
PV	→	SI	0.271	0.000	0.369	0.000	0.898
PV	→	SA	0.166	0.000	0.236	0.004	0.789
SPP	→	SI	0.494	0.000	0.578	0.000	0.646
SPP	→	SA	0.410	0.000	0.661	0.000	2.003**
SA	→	PE	-0.332	0.001	-0.232	0.009	0.730
SA	→	PT	-0.288	0.009	-0.545	0.000	-1.405
SI	→	PE	-0.314	0.000	-0.075	0.186	2.938***
SI	→	PT	-0.216	0.000	0.109	0.294	2.713***
PT	→	FSA	-0.096	0.014	-0.064	0.301	0.434
PE	→	FSA	-0.271	0.000	-0.536	0.005	-1.333

Table: Full Model (PT; NS V. S) Squared multiple correlations

	Non-smokers	Smokers
SPP	.000	.000
PV	.000	.000
SA	.231	.636
SI	.169	.436
PE	.123	.243
PT	.057	.179
FSA	.100	.172

Appendix B.1.12: Full Model differences between samples for social threats

Table: (ST; NS V. S) Group Differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
PV	→	SI	0.180	0.000	0.478	0.003	1.779*
PV	→	SA	0.173	0.000	0.613	0.000	2.609***
SPP	→	SI	0.813	0.000	0.722	0.000	-0.499
SPP	→	SA	1.009	0.000	0.548	0.000	-2.514**
SA	→	PE	-0.510	0.000	-0.273	0.009	1.677*
SA	→	PT	-0.540	0.000	-0.730	0.000	-0.822
SI	→	PE	-0.127	0.039	-0.235	0.000	-1.166
SI	→	PT	-0.073	0.338	0.129	0.232	1.531
PT	→	FSA	-0.126	0.000	-0.243	0.000	-1.423
PE	→	FSA	-0.243	0.000	-0.406	0.004	-1.077

Table: (ST; NS V. S) Squared multiple correlations

	Non-Smokers	Smokers
SPP	.000	.000
PV	.000	.000
SA	.347	.767
SI	.183	.442
PE	.135	.492
PT	.087	.227
FSA	.113	.311

Appendix B.1.13: Smoking attitude to future smoking intent relationship between samples for physical threats

Table: SA→FSA (PT; NS V. S) Group Differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
SA	→	FSA	1.218	0.000	0.605	0.000	-2.967***

Table: SA→FSA (PT; NS V. S) Squared Multiple correlations

	Non-Smokers	Smokers
SA	.000	.000
FSA	.335	.426

Appendix B.1.14: Smoking attitude to future smoking intent relationship between samples for social threats

Table: SA→FSA (ST; NS V. S) Group Differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
SA	→	FSA	0.789	0.000	0.577	0.000	-1.126

Table: SA→FSA (ST; NS V. S) Squared Multiple Correlations

	Non-Smokers	Smokers
SA	.000	.000
FSA	.270	.442

Appendix B.1.15: Social emotion response to future smoking attitude relationship between samples for physical threats

Table: Sem→FSA model (PT; NS V. S) Group differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSA	0.056	0.037	-0.051	0.595	-1.069

Table: Sem→FSA model (PT; NS V. S) squared multiple correlations

	Non-Smokers	Smokers
SEm	.000	.000
FSA	.010	.003

Appendix B.1.16: Physical emotion response to future smoking attitude relationship between samples for social threats

Table: Pem→FSA (ST; NS V. S) Group differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSA	-0.039	0.233	0.035	0.732	0.687

Table: Pem→FSA (ST; NS V. S) Squared multiple correlations

	Non-Smokers	Smokers
PEm	.000	.000
FSA	.004	.001

Appendix B.1.17: Social emotion response to future smoking attitude relationship between samples for physical threats

Table: Sem→FSA model (PT; NS V. S) Group differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSA	0.056	0.037	-0.051	0.595	-1.069

Table: Sem→FSA model (PT; NS V. S) squared multiple correlations

	Non-Smokers	Smokers
SEm	.000	.000
FSA	.010	.003

Appendix B.1.18: Physical emotion response to future smoking attitude relationship between samples for physical threats

Table: PEm→FSA model (PT; NS V. S) Group Differences

			Non-Smokers		Smokers		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSA	0.034	0.473	-0.339	0.035	-2.23**

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table: PEm→FSA model (PT; NS V. S) Squared multiple correlations

	Non-Smokers	Smokers
PEm	.000	.000
FSA	.001	.038

Appendix B.2 Non-smoker sample

Appendix B.2.1: Non-smoker sample School Distribution

Table: Non-smokers Sample participating schools

School	Frequency	Percent
Fort Pitt Girls Grammar	201	13.6
Herne Bay High School	138	9.3
Simon Langton Girls Grammar	286	19.3
School	10	.7
Spires Technology College	28	1.9
Saint Lawrence College	185	12.5
Walderslade Girls	8	.5
Abbey School Faversham	144	9.7
Robert Napier	57	3.9
Saint Georges Church of England	109	7.4
Thames View	44	3.0
Hundrend of Hoo	87	5.9
Astor College Dover	87	5.9
Charles Dickens School	41	2.8
Chatham Grammar School Boys	54	3.7
Hartsdown Academy		
Total	1479	100

Appendix B.2.2: Pattern Matrix (Non-smoker sample)

Table: Path Diagram (Non-Smoker)

Factor	PT	PE	FSI	PV	SI	SA	SPP	FSA
Factor	**PT3**	**PE1**	**FSI2**	**PV1**	**SI2**	**SA7**	**SPP2**	**FSA1**
Item	.866	.872	.762	.778	.773	.731	.876	.971
Loadings	**PT7**	**PE3**	**FSI1**	**PV6**	**SI1**	**SA9**	**SPP1**	**FSA4**
	.859	.839	.759	.777	.755	.672	.628	.571
	PT2	**PE4**	**FSI3**	**PV5**	**SI3**	**SA1**	**SPP5**	**FSA2**
	.850	.789	.740	.773	.741	.596	.349	.338
	PT8	**PE2**	**FSI4**	**PV2**	**SI4**	**SA7**		
	.815	.743	.719	.637	.605	.731		
	PT4	**PE8**						
	.797	.428						
	PT6							
	.781							
	PT1							
	.758							
	PT5							
	.712							

Appendix B.2.3: Factor Correlation Matrix and squared correlation tests (Non-smoker sample)

Table: Factor Correlation Matrix (Non-smoker)

Factor	PT	PE	FSI	PV	SI	SA	SPP	FSA
PT	-							
PE	.593	-						
FSI	-.246	-.284	-					
PV	-.124	-.051	.186	-				
SI	-.183	-.259	.594	.216	-			
SA	-.065	-.197	.214	.188	.303	-		
SPP	-.034	-.125	.166	.085	.256	.357	-	
FSA	-.292	-.368	.420	.242	.301	.472	.281	-

Table: SA 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SA	<-->	PT	-0.065	0.004225	0.469
SA	<-->	PE	-0.197	0.038809	0.469
SA	<-->	FSI	0.214	0.045796	0.469
SA	<-->	PV	0.188	0.035344	0.469
SA	<-->	SI	0.303	0.091809	0.469
SA	<-->	SPP	0.357	0.127449	0.469
SA	<-->	FSA	0.472	0.222784	0.469

Table: SPP ‘AVE’ EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SPP	<-->	PT	-0.034	0.001156	0.428
SPP	<-->	PE	-0.125	0.015625	0.428
SPP	<-->	FSI	0.166	0.027556	0.428
SPP	<-->	PV	0.085	0.007225	0.428
SPP	<-->	SI	0.256	0.065536	0.428
SPP	<-->	SA	0.357	0.127449	0.428
SPP	<-->	FSA	0.472	0.222784	0.428

Table: FSA ‘AVE’ EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
FSA	<-->	PT	-0.292	0.085264	0.461
FSA	<-->	PE	-0.368	0.135424	0.461
FSA	<-->	FSI	0.42	0.1764	0.461
FSA	<-->	PV	0.242	0.058564	0.461
FSA	<-->	SI	0.301	0.090601	0.461
FSA	<-->	SA	0.472	0.222784	0.461
FSA	<-->	SPP	0.281	0.078961	0.461

Appendix B.2.4: Chi-square test (Non-smoker sample)

Table: Chi-square test CFA Non-Smokers

	PT	PE	FSI	PV	SI	SA	FSA	SPP
PT	*660.008* *271****							
PE	795.454 272***	*660.008* *271****						
FSI	1581.711 272***	1541.794 272***	*660.008* *271****					
PV	1655.747 272***	1362.344 272***	1428.817 272***	*660.008* *271****				
SI	2185.757 278***	1769.974 272***	1308.242 272***	1630.001 278***	*660.008* *271****			
SA	1737.005 272***	1721.327 272***	1293.184 272***	1424.018 272***	1139.772 278***	*660.008* *271****		
FSA	1569.628 272***	1510.058 272***	926.731 272***	1296.133 272***	1346.103 272***	1226.005 272***	*660.008* *271****	
SPP	1470.168 272***	1427.585 272***	1121.563 272***	1345.313 272***	1715.369 278***	1210.012 272***	1069.439 272***	*660.008* *271****

Table: FSA ‘AVE’ CFA Squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SI	<-->	SA	0.507	0.257049	0.458
PE	<-->	SA	-0.255	0.065025	0.458
FSI	<-->	SA	0.434	0.188356	0.458
PT	<-->	SA	-0.197	0.038809	0.458
PV	<-->	SA	0.276	0.076176	0.458
SA	<-->	SPP	0.463	0.214369	0.458
SA	<-->	FSA	0.543	0.294849	0.458

Appendix B.2.5: Factor correlation matrix (Non-smoker sample)

Table No: Factor Correlation matrix CFA Non-Smokers

Factor	FSA	PT	PV	PE	FSI	SI	SA	SPP
FSA	1							
PT	-0.311	1						
PV	0.265	-0.288	1					
PE	-0.301	0.544	-0.096	1				
FSI	0.640	-0.220	0.223	-0.275	1			
SI	0.363	-0.165	0.265	-0.224	0.514	1		
SA	0.543	-0.197	0.276	-0.255	0.434	0.507	1	
SPP	0.341	-0.210	0.189	-0.209	0.273	0.351	0.463	1

Appendix B.2.6: Full structural equations model (Non-smoker sample)

Table: Full model (NS) structural equations model (SEM) regression weights

Relationship			Estimate	S.E.	C.R.	P	Label
PV	→	SI	.159	.023	6.992	***	par_19
PV	→	SA	.147	.023	6.433	***	par_20
SPP	→	SI	.408	.043	9.551	***	par_21
SPP	→	SA	.521	.049	10.703	***	par_22
SI	→	PT	-.295	.078	-3.772	***	par_23
SI	→	PE	-.398	.089	-4.459	***	par_24
SA	→	PT	-.321	.087	-3.709	***	par_25
SA	→	PE	-.574	.101	-5.704	***	par_26
PT	→	FSI	-.078	.029	-2.706	.007	par_27
PT	→	FSA	-.132	.032	-4.194	***	par_28
PE	→	FSA	-.174	.028	-6.282	***	par_29
PE	→	FSI	-.150	.025	-5.940	***	par_30

Table: Full model (NS) Squared multiple correlations

	Estimate
SPP	.000
PV	.000
SA	.234
SI	.153
PE	.104
PT	.056
FSA	.139
FSI	.096

Appendix B.2.7: Full structural equations model between threats types (Non-smoker sample)

Table: NS; PT V. ST; Group Differences between threat classifications

			Physical threat		Social threat		
Relationship			Estimate	P	Estimate	P	z-score
PV	→	SI	0.188	0.000	0.174	0.000	-0.264
PV	→	SA	0.131	0.000	0.165	0.000	0.611
SPP	→	SI	0.285	0.000	0.657	0.000	3.249***
SPP	→	SA	0.292	0.000	1.017	0.000	4.808***
SI	→	PT	-0.353	0.002	-0.239	0.064	0.664
SI	→	PE	-0.637	0.000	-0.256	0.087	1.911*
SA	→	PT	-0.031	0.818	-0.312	0.009	-1.554
SA	→	PE	-0.437	0.006	-0.595	0.000	-0.745
PT	→	FSI	-0.026	0.605	-0.054	0.177	-0.436
PT	→	FSA	-0.053	0.324	-0.131	0.006	-1.098
PE	→	FSA	-0.258	0.000	-0.148	0.000	1.769*
PE	→	FSI	-0.281	0.000	-0.090	0.007	3.419***

Table: NS; PT V. ST Squared Multiple Correlations:

Factor	**SI**	**SA**	**PE**	**PT**	**FSA**	**FSI**
Physical	.139	.145	.128	.032	.144	.161
Social	.205	.316	.098	.053	.159	.064

Appendix B.2.8: Smoking attitude to future smoking attitude relationship between threat types

Table: SA→FSA (PT V. ST) Group differences

			Physical threat		Social threat		
Relationship			Estimate	P	Estimate	P	z-score
SA	→	FSA	1.218	0.000	0.787	0.000	-2.273**

Table: SA→FSA (PT V. ST) Squared multiple correlations

	Physical threat	Social threat
SA	.000	.000
FSA	.335	.269

Appendix B.2.9: Smoking intent to future smoking intent relationship between threat types

Table: SI→FSI (PT V. ST) Group Differences

			Physical threat		Social threat		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSI	1.201	0.000	1.040	0.000	-1.009

Table: SI→FSI (PT V. ST) Squared multiple correlations

	Physical threat	Social threat
SI	.000	.000
FSI	.258	.262

Appendix B.2.10: ANOVA POST HOC LSD between threats post exposure (NS sample)

Factor	ANOVA	Social Threat	Physical Threat	Non Threat
PEm	F(2,740)=145.996**, p<.001 (w)	2.873;1.344	3.746;1.209 *PTr>STr**, p<.001*	2.226;1.428 *PTr>NTr**, p<.001* *STr>NTr**, p<.001*
SEm	F(2,810)=30.639**, p<.001 (w)	2.395;1.291 *STr>PTr*, p=.045*	2.248;1.316	1.742;1.127 *PTr>NTr**, p<.001 STr>NTr**, p<.001*
AAD	F(2, 707)= 76.147**, p<.001(w)	3.436;1.089	3.972;.970 *PTr>STr**,p<.001*	3.012;1.362 *PTr>NTr**,p=.001* *STr>NTr**,p=.001*
ATAD	F(2,740)=41.357**, p<.001 (w)	3.047;1.174	3.488;1,126	2.760;1.299 *PTr>NTr**,p=.001* *STr>NTr**,p=.001*
MD	F(2, 1476)= 14.717**, p<.000	2.335;1.004 *STr>PTr**,p=.001*	2.141;1.017	2.531;1.130 *NTr>PTr*,p=.008* *NTr>STr**,p<.001*

Appendix B.2.11: Critical value classification (Non-smoker sample)

Table: Critical value split between threats

Classification	Emotion Control	Danger Control
All	56.2% (n=831)	43.8% (n=648)
Social Threat	54.2% (n=315)	45.8% (n=266)
Physical Threat	59.2% (n=361)	40.8% (n=249)
Non Threat	53.8% (n=155)	46.2% (n=133)

Appendix B.2.12: Critical value model between threat types (Non-smoker sample)

Table: CV model (NS; PT V. ST) Squared Multiple Correlations

	SI	SA	CV	FSI	FSA
Physical	.135	.142	.014	.007	.006
Social	.202	.313	.006	.001	.001

Table: CV model (NS; PT V. ST) Group Differences

			Physical threat		Social threat		
	Relationship		Estimate	P	Estimate	P	z-score
PV	→	SI	0.187	0.000	0.170	0.000	-0.325
PV	→	SA	0.130	0.000	0.162	0.000	0.564
SPP	→	SI	0.278	0.000	0.656	0.000	3.306***
SPP	→	SA	0.286	0.000	1.024	0.000	4.855***
SI	→	CV	-0.067	0.612	0.006	0.966	0.384
SA	→	CV	-0.326	0.045	-0.173	0.161	0.752
CV	→	FSI	-0.056	0.055	-0.018	0.468	1.008
CV	→	FSA	-0.052	0.093	-0.018	0.553	0.790

Appendix B.2.13: Smoking attitude to future smoking attitude relationship between critical value categories for physical threats (Non-smoker sample)

Table: SA→FSA (PT; EC V. DC) Group Differences

			Emotion Control (EC)		Danger Control (DC)		
	Relationship		Estimate	P	Estimate	P	z-score
SA	→	FSA	1.319	0.000	0.789	0.000	-1.851*

Table: SA→FSA (PT; EC V. DC)Squared Multiple correlations

	EC	DC
SA	.000	.000
FSA	.423	.148

Appendix B.2.14: Smoking attitude to future smoking attitude relationship between critical value categories for social threats (Non-smoker sample)

Table: SA→FSA (ST; EC V. DC) Group differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SA	→	FSA	0.902	0.000	0.654	0.000	-1.150

Table: SA→FSA (ST; EC V. DC) squared multiple correlations

	EC	DC
SA	.000	.000
FSA	.423	.165

Appendix B.2.15: Smoking intent to future smoking intent relationship between critical value categories for physical threats (Non-smoker sample)

Table: SI→FSI (PT; EC V. DC) Group Differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSI	1.345	0.000	1.032	0.000	-1.418

Table: SI→FSI (PT; EC V. DC) Squared Multiple correlations

	EC	DC
SI	.000	.000
FSI	.250	.258

Appendix B.2.16: Smoking intent to future smoking intent relationship between critical value categories for social threats (Non-smoker sample)

Table: SI→FSI (ST; EC V. DC) Group differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSI	1.048	0.000	0.939	0.000	-0.496

Table: SI→FSI (ST; EC V. DC) Squared multiple correlations

	EC	DCl
SI	.000	.000
FSI	.238	.252

Appendix B.2.17: Full model including physical emotions between threat categories (Non-smoker sample)

Table: Full model (PEm; PT V. ST) Group Differences between threat classifications

			Social threat		Physical threat		
Relationship			Estimate	P	Estimate	P	z-score
PEm	→	FSI	0.018	0.521	0.021	0.642	0.054
PEm	→	FSA	-0.016	0.628	0.088	0.061	1.816*

Table: Full model (PEm; PT V. ST) Squared Multiple Correlations

Factor	SI	SA	PE	PT	FSA	FSI
Physical	.139	.145	.128	.032	.159	.163
Social	.205	.316	.098	.053	.159	.067

Appendix B.2.18: Full model including social emotions between threat categories (Non-smoker sample)

Table: Full model (SEm; PT V. ST) Group differences between threat classifications

			Social threat		Physical threat		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSI	0.006	0.805	0.040	0.113	0.985
SEm	→	FSA	0.009	0.758	0.049	0.067	1.050

Table: Full model (SEm; PT V. ST) Squared Multiple Correlations

Factor	SI	SA	PE	PT	FSA	FSI
Physical	.139	.145	.128	.032	.148	.163
Social	.205	.316	.098	.053	.160	.065

Appendix B.2.19: Physical emotion response to future smoking intent relationship between critical value categories for social threats (Non-smoker sample)

Table: PEM→FSI (ST; EC V. DC) Group Difference between critical value responses

			Emotion Control (EC)		Danger control (DC)		
Relationship			Estimate	P	Estimate	P	z-score
PEm	→	FSI	0.075	0.086	-0.066	0.054	-2.54**

Table: PEM→FSI (ST; EC V. DC) Squared multiple correlations

	FSI
Emotion	.015
Danger	.022

Appendix B.2.20: Physical emotion response to future smoking attitude relationship between critical value categories for social threats (Non-smoker sample)

Table: PEm→FSA (ST; EC V. DC) Group Difference between critical value responses

			EC		**DC**		
Relationship			Estimate	P	Estimate	P	z-score
PEm	→	FSA	0.030	0.482	-0.120	0.018	-2.26**

Table: PEM→FSI (ST; EC V. DC) Squared multiple correlations

	FSA
EC	.003
DC	.033

Appendix B.2.21: Social emotion response to future smoking intent relationship between critical value categories for social threats (Non-smoker sample)

Table: SEm→FSI (ST; EC V. DC) Group Difference between critical value responses

			EC		**DC**		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSI	0.066	0.039	0.000	0.998	-1.540

Table: Squared multiple correlation

	FSI
EC	.018
DC	.000

Appendix B.2.22: Social emotion response to future smoking attitude relationship between critical value categories for social threats (Non-smoker sample)

Table: SEm→FSA (ST; EC V. DC) Group Difference between critical value responses

			Emotion Control (EC)		**Danger control (DC)**		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSA	0.011	0.706	-0.006	0.885	-0.341

Appendix B.2.23: Social emotion response to future smoking intent relationship between critical value categories for physical threats (Non-smoker sample)

Table: SEm→FSI (PT; EC V. DC) Group Difference between critical value responses

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSI	0.049	0.071	0.066	0.113	0.351

Appendix B.2.24: Social emotion response to future smoking attitude relationship between critical value categories for physical threats (Non-smoker sample)

Table: SEm→FSA (PT; EC V. DC) Group Difference between critical value responses

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSA	0.043	0.202	0.071	0.018	0.613

Appendix B.2.25: Physical emotion response to future smoking intent relationship between critical value categories for physical threats (Non-smoker sample)

Table: PEm→FSI(PT; EC V. DC) Group Difference between critical value responses

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
PEm	→	FSI	0.020	0.535	-0.028	0.323	-1.120

Appendix B.2.26: Physical emotion response to future smoking attitude relationship between critical value categories for physical threats (Non-smoker sample)

Table: PEm→FSA (PT; EC V. DC) Group Difference between critical value responses

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
PEm	→	FSA	0.033	0.285	0.018	0.570	-0.342

Appendix B.3 Smoker sample

Appendix B.3.1: Smoker sample School Distribution

Table: Smokers Sample participating schools

School	Frequency	Percent
Fort Pitt Girls Grammar	12	3.4
Herne Bay High School	27	7.5
Simon Langton Girls Grammar School	13	3.6
Spires Technology College	3	.8
Saint Lawrence College	6	1.7
Walderslade Girls	21	5.9
Abbey School Faversham	2	.6
Robert Napier	75	20.9
Saint Georges Church of England	38	10.6
Thames View	47	13.1
Hundrend of Hoo	49	13.7
Astor College Dover	34	9.5
Charles Dickens School	18	5.0
Hartsdown Academy	13	3.6
Total	358	100.0

Appendix B.3.2: Pattern Matrix (Smoker sample)

Table: Pattern Matrix (Smoker)

Factor	PT	SI	PV	FSA	SA	FSIQ	PE	SPP
Factor Item loading	**PT6** .865	**SI3** .982	**PV5** .755	**FSA1** .892	**SPP4** .857	**FSIQ1** .910	**PE4** .801	**SPP1** .910
	PT3 .859	**SI2** .850	**PV3** .750	**FSA4** .810	**SA1** .710	**FSIQ3** .791	**PE2** .770	**SPP2** .661
	PT7 .843	**SI1** .826	**PV6** .720	**FSA3** .616	**SA7** .549	**FSIQ2** .788	**PE1** .546	**SPP5** .327
	PT5 .807	**SI4** .706	**PV4** .701	**FSA2** .577	**SA8** .513		**PE3** .508	
	PT8 .749	**SI5** .658	**PV2** .697	**FSA5** .468	**SA9** .400			
	PT2 .696		**PV1** .558					
	PT1 .695							

Appendix B.3.3: Factor Correlation Matrix and squared correlation test (Smoker sample)

Table: Factor Correlation Matrix (Smoker)

Factor	PT	SI	PV	FSA	SA	FSIQ	PE	SPP
PT	-							
SI	-.258	-						
PV	-.274	.294	-					
FSA	-.163	.435	.248	-				
SA	-.178	.554	.187	.478	-			
FSIQ	.288	-.338	-.136	-.247	-.215	-		
PE	.448	-.485	-.122	-.286	-.330	.408	-	
SPP	-.041	.461	.085	.307	.538	-.122	-.179	-

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.

Table: PV 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
PT	<-->	PV	-0.274	0.075076	0.49
SI	<-->	PV	0.294	0.086436	0.49
PV	<-->	PV	0	0	0.49
FSA	<-->	PV	0.248	0.061504	0.49
SA	<-->	PV	0.187	0.034969	0.49
FSIQ	<-->	PV	-0.136	0.018496	0.49
PE	<-->	PV	-0.122	0.014884	0.49
SPP	<-->	PV	0.085	0.007225	0.49

Table: SA 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
PT	<-->	SA	-0.178	0.031684	0.385
SI	<-->	SA	0.554	0.306916	0.385
PV	<-->	SA	0.187	0.034969	0.385
FSA	<-->	SA	0.478	0.228484	0.385
SA	<-->	SA	0	0	0.385
FSIQ	<-->	SA	-0.215	0.046225	0.385
PE	<-->	SA	-0.33	0.1089	0.385
SPP	<-->	SA	0.538	0.289444	0.385

Table: SPP 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
PT	<-->	SPP	-0.041	0.001681	0.457
SI	<-->	SPP	0.461	0.212521	0.457
PV	<-->	SPP	0.085	0.007225	0.457
FSA	<-->	SPP	0.307	0.094249	0.457
SA	<-->	SPP	0.538	0.289444	0.457
FSIQ	<-->	SPP	-0.122	0.014884	0.457
PE	<-->	SPP	-0.179	0.032041	0.457
SPP	<-->	SPP	0	0	0.457

Table: FSA 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
PT	<-->	FSA	-0.163	0.026569	0.477
SI	<-->	FSA	0.435	0.189225	0.477
PV	<-->	FSA	0.248	0.061504	0.477
FSA	<-->	FSA	0	0	0.477
SA	<-->	FSA	0.478	0.228484	0.477
FSIQ	<-->	FSA	-0.247	0.061009	0.477
PE	<-->	FSA	-0.286	0.081796	0.477
SPP	<-->	FSA	0.307	0.094249	0.477

Table: PE SA 'AVE' EFA squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
PT	<-->	PE	0.448	0.200704	0.448
SI	<-->	PE	-0.485	0.235225	0.448
PV	<-->	PE	-0.122	0.014884	0.448
FSA	<-->	PE	-0.286	0.081796	0.448
SA	<-->	PE	-0.33	0.1089	0.448
FSIQ	<-->	PE	0.408	0.166464	0.448
PE	<-->	PE	0	0	0.448
SPP	<-->	PE	-0.179	0.032041	0.448

Appendix B.3.4: Chi-Square test (Smoker sample)

Table: Chi-Square test Smoker CFA

	PT	SI	PV	FSA	SA	FSIQ	PE	SPP
PT	*659.463* *436****							
SI	749.293 437***	*659.463* *436****						
PV	807.733 437***	681.578 437***	*659.463* *436****					
FSA	847.035 437***	691.795 437***	701.399 437***	*659.463* *436****				
SA	797.707 437***	671.177 437***	688.38 437***	684.405 437***	*659.463* *436****			
FSIQ	691.671 437***	778.436 437***	785.544 437***	818.782 437***	804.125 437***	*659.463* *436****		
PE	680.722 437***	833.357 437***	770.476 437***	822.238 437***	813.384 437***	670.581 437***	*659.463* *436****	
SPP	766.03 437***	664.434 437***	685.506 437***	689.197 437***	665.439 437***	779.43 437***	782.558 437***	*659.463* *436****

Appendix B.3.5: CFA Squared correlation test

Table: FSA ‘AVE’ CFA Squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SA	<-->	PT	-0.359	0.128881	0.455
SA	<-->	PE	-0.48	0.2304	0.455
SA	<-->	SPP	0.833	0.693889	0.455
SA	<-->	PV	0.558	0.311364	0.455
SA	<-->	SI	0.584	0.341056	0.455
SA	<-->	FSA	0.691	0.477481	0.455
SA	<-->	FSIQ	-0.472	0.222784	0.455

Table: FSA ‘AVE’ CFA Squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SI	<-->	FSA	0.378	0.142884	0.442
PV	<-->	FSA	0.495	0.245025	0.442
PT	<-->	FSA	-0.479	0.229441	0.442
FSIQ	<-->	FSA	-0.446	0.198916	0.442
PE	<-->	FSA	-0.437	0.190969	0.442
SPP	<-->	FSA	0.506	0.256036	0.442
SA	<-->	FSA	0.691	0.477481	0.442

Table: SPP ‘AVE’ CFA Squared correlation test

Item	Correlated	Item	Correlation	C^2	AVE
SI	<-->	SPP	0.623	0.388129	0.498
FSIQ	<-->	SPP	-0.404	0.163216	0.498
PE	<-->	SPP	-0.419	0.175561	0.498
PV	<-->	SPP	0.483	0.233289	0.498
FSA	<-->	SPP	0.506	0.256036	0.498
PT	<-->	SPP	-0.285	0.081225	0.498
SA	<-->	SPP	0.833	0.693889	0.498

Appendix B.3.6: Correlation matrix (Smokers sample)

Table: Correlation Matrix table

	PV	**PT**	**SA**	**SI**	**FSA**	**FSIQ**	**PE**	**SPP**
PV	1							
PT	-0.335	1						
SA	0.558	-0.359	1					
SI	0.463	-0.169	0.584	1				
FSA	0.495	-0.479	0.691	0.378	1			
FSIQ	-0.315	0.243	-0.472	-0.375	-0.446	1		
PE	-0.208	0.431	-0.480	-0.566	-0.437	0.496	1	
SPP	0.483	-0.285	0.833	0.623	0.506	-0.404	-0.419	1

Appendix B.3.7: Full structural equations model (Smoker sample)

Table: Full model (S) structural equations model (SEM) regression weights

Relationship			Estimate	S.E.	C.R.	P	Label
PV	→	SI	.410	.090	4.584	***	par_25
PV	→	SA	.341	.068	4.997	***	par_26
SPP	→	SI	.580	.069	8.450	***	par_27
SPP	→	SA	.531	.062	8.560	***	par_28
SI	→	PT	-.039	.064	-.604	.546	par_29
SI	→	PE	-.357	.064	-5.538	***	par_30
SA	→	PT	-.351	.101	-3.494	***	par_31
SA	→	PE	-.243	.093	-2.614	.009	par_32
PE	→	FSIQ	.574	.083	6.885	***	par_33
PE	→	FSA	-.242	.056	-4.302	***	par_34
PT	→	FSIQ	.066	.067	.979	.328	par_35
PT	→	FSA	-.165	.048	-3.447	***	par_36

Table: Squared multiple correlation

	Estimate
SPP	.000
PV	.000
SI	.356
SA	.587
PE	.326
PT	.098
FSIQ	.277
FSA	.225

Appendix B.3.8: Full structural equations model between threat types (Smoker sample)

Table: Full model (S; PT V. ST) Group differences between threat classifications

			Physical threat		**Social threat**		
	Relationship		Estimate	P	Estimate	P	z-score
PV	→	SI	0.455	0.000	0.428	0.002	-0.139
PV	→	SA	0.261	0.006	0.467	0.000	1.332
SPP	→	SI	0.590	0.000	0.478	0.000	-0.803
SPP	→	SA	0.604	0.000	0.410	0.000	-1.518
SI	→	PT	0.032	0.714	0.077	0.557	0.282
SI	→	PE	-0.209	0.010	-0.509	0.000	-1.941*
SA	→	PT	-0.464	0.000	-0.517	0.011	-0.213
SA	→	PE	-0.320	0.009	-0.263	0.142	0.266
PE	→	FSIQ	0.624	0.000	0.631	0.000	0.036
PE	→	FSA	-0.337	0.004	-0.268	0.002	0.481
PT	→	FSIQ	0.033	0.793	0.074	0.477	0.253
PT	→	FSA	-0.018	0.823	-0.358	0.000	-2.745***

Table: Full model (S; PT V. ST) Squared Multiple Correlations

	SI	**SA**	**PE**	**PT**	**FSIQ**	**FSA**
Physical	.355	.589	.255	.133	.221	.182
Social	.345	.558	.541	.155	.384	.366

Appendix B.3.9: Smoking attitude to future smoking attitude relationship between threat types (Smoker sample)

Table: SA→FSA (S; PT V. ST) Group Differences

			Physical threat		**Social threat**		
	Relationship		Estimate	P	Estimate	P	z-score
SA	→	FSA	0.639	0.000	0.654	0.000	0.081

Table: SA→FSA (S; PT V. ST) Squared multiple correlations

	Physical threat	Social threat
SA	.000	.000
FSA	.363	.365

Appendix B.3.10: Smoking intent to future smoking intent to quit relationship between threats types (Smoker sample)

Table: SI→FSIQ (S; PT V. ST) Group Differences

			Physical threat		Social threat		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSIQ	-0.274	0.000	-0.433	0.000	-1.407

Table: SI→FSIQ (S; PT V. ST) squared multiple correlations

	Physical threat	Social threat
SI	.000	.000
FSIQ	.091	.257

Appendix B.3.11: Critical value classification (Smokers sample)

Table: Critical value split classification

Critical value	Frequency
Fear Control	163
Danger Control	195
Total	358

Appendix B.3.12: Critical value model between threat types (Smoker sample)

Table: CV model (S; PT V. ST) Group differences between threat classifications

Relationship			Physical threat		Social threat		
			Estimate	P	Estimate	P	z-score
PV	→	SI	0.457	0.000	0.420	0.003	-0.191
PV	→	SA	0.278	0.003	0.434	0.000	1.025
SPP	→	SI	0.583	0.000	0.482	0.000	-0.729
SPP	→	SA	0.597	0.000	0.430	0.000	-1.304
SI	→	CV	-0.287	0.001	-0.502	0.001	-1.193
SA	→	CV	0.231	0.080	0.228	0.311	-0.014
CV	→	FSIQ	0.119	0.243	0.223	0.006	0.796
CV	→	FSA	-0.051	0.422	0.038	0.528	1.016

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table: CV model (S; PT V. ST) Squared Multiple Correlations

	SI	SA	CV	FSIQ	FSA
Physical	.353	.618	.085	.010	.005
Social	.346	.557	.143	.058	.003

Appendix B.3.13: Smoking attitude to future smoking attitude relationship between critical value categories for physical threats (Smoker sample)

Table: SA→FSA (PT; EC V. DC) Group Differences

			Emotion Control (EC)		Danger control (DC)		
Relationship			Estimate	P	Estimate	P	z-score
SA	→	FSA	0.641	0.000	0.593	0.000	-0.197

Table: SA→FSA (PT; EC V. DC) Squared Multiple correlations

	EC	DC
SA	.000	.000
FSA	.383	.327

Appendix B.3.14: Smoking attitude to future smoking attitude relationship between critical value categories for social threats (Smoker sample)

Table: SA→FSA (ST; EC V. DC) Group Differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SA	→	FSA	0.500	0.000	1.052	0.000	1.847*

Table: SA→FSA (ST; EC V. DC) Squared Multiple correlations

	EC	DC
SA	.000	.000
FSA	.292	.558

Appendix B.3.15: Smoking intent to future smoking intent to quit relationship between critical value categories for physical threats (Smoker sample)

Table: SI→FSIQ (PT; EC V. DC) Group Differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSIQ	-0.230	0.025	-0.381	0.003	-0.925

Table: SI→FSIQ (PT; EC V. DC) Squared multiple correlations

	EC	DC
SI	.000	.000
FSIQ	.076	.137

Appendix B.3.16: Smoking intent to future smoking intent to quit relationship between critical value categories for social threats (Smoker sample)

Table: SI→FSIQ (ST; EC V. DC) Group Differences

			EC		DC		
Relationship			Estimate	P	Estimate	P	z-score
SI	→	FSIQ	-0.335	0.009	-0.451	0.000	-0.721

Table: SI→FSIQ (ST; EC V. DC) Squared multiple correlation

	EC	DC
SI	.000	.000
FSIQ	.149	.310

Appendix B.3.17: Full model with physical emotions between threat types (Smoker sample)

Table: Full model (PEm; PT V. ST) Group differences between threat classifications

				Social threat		Physical threat		
Relationship				Estimate	P	Estimate	P	z-score
PEm	→	FSIQ		-0.104	0.215	0.334	0.044	2.362**
PEm	→	FSA		0.129	0.053	-0.121	0.245	-2.019**

Table: Full model (PEm; PT V. ST) Squared Multiple Correlations

	SI	SA	PE	PT	FSIQ	FSA
Physical	.355	.590	.252	.133	.215	.171
Social	.345	.559	.546	.156	.406	.412

Appendix B.3.18: Full model with social emotions between threat types (Smoker sample)

Table: Full model (SEm; PT V. ST) Group differences between threat classifications

			Social Threat		Physical Threat		
Relationship			Estimate	P	Estimate	P	z-score
SEm	→	FSIQ	-0.155	0.038	0.115	0.251	2.159**
SEm	→	FSA	0.079	0.172	-0.001	0.989	-0.925

Table: Full model (SEm; PT V. ST) Squared Multiple Correlations

	SI	SA	PE	PT	FSIQ	FSA
Physical	.355	.589	.255	.133	.226	.182
Social	.345	.558	.544	.156	.434	.392

Appendix B.3.19: Physical emotion to future smoking intent to quit relationship between critical value categories for social threats (Smoker sample)

Table: PEm →FSIQ (S-ST; EC V. DC)

			Emotion Control (EC)		Danger control (DC)		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSIQ	0.259	0.312	-0.094	0.365	-1.277

Appendix B.3.20: Physical emotion to future smoking attitude relationship between critical value categories for social threats (Smoker sample)

Table: PEm →FSA (S-ST; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSA	-0.247	0.175	0.093	0.308	1.671*

Appendix B.3.21: Social emotion to future smoking intent to quit relationship between critical value categories for social threats (Smoker sample)

Table: SEm →FSIQ (S-ST; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSIQ	0.116	0.530	-0.094	0.458	-0.938

Appendix B.3.22: Social emotion to future smoking attitude relationship between critical value categories for social threats (Smoker sample)

Table: SEm→FSA (S-ST; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSA	-0.003	0.968	0.040	0.709	0.335

Appendix B.3.23: Social emotion to future smoking intent to quit relationship between critical value categories for physical threats (Smoker sample)

Table: SEM→FSIQ (S-PT; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSIQ	0.136	0.353	0.119	0.279	-0.095

Appendix B.3.24: Social emotion to future smoking attitude relationship between critical value categories for physical threats (Smoker sample)

Table: SEm→FSA (S-PT; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
SEm	→	FSA	0.068	0.486	-0.104	0.261	-1.280

Appendix B.3.25: Physical emotion to future smoking attitude relationship between critical value categories for social threats (Smoker sample)

Table: PEM →FSIQ (S-PT; EC V. DC) for group differences

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSIQ	0.573	0.192	0.494	0.004	-0.166

Appendix B.3.26: Physical emotion to future smoking attitude relationship between critical value categories for physical threats (Smoker sample)

Table: PEm →FSA (S-PT; EC V. DC)

			EC		DC		
	Relationship		Estimate	P	Estimate	P	z-score
PEm	→	FSA	-0.445	0.142	-0.188	0.132	0.784